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PETER ZODAC

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ROCKS and MINERALS PEEKSKILL, N. Y., U. S. A.

The official Journal of the Rocks and Minerals Association

CHIPS FROM THE QUARRY

We're booked for the Denver Convention June 13-16, 1948

According to an official notice just received from headquarters of the American Federation of Mineralogical Societies, Mr. Richard M. Pearl, Convention Chairman, has us all booked for the first National Convention to be held at Denver, Colo., June 13-16, 1948.

All we need now are a couple thousand dollars, a big car, three or four girls, six weeks of free time, and good health—and we will be off for the Convention.

So far our assets consist of a headache, a big hole in the pocket, and lots of work but—we can't let Mr. Pearl down. We will be there even if we have to walk—we could thumb a ride and perhaps some nice girl might pick us up and take us part way.

The Convention at Detroit last year was such an enjoyable one that we just have to be present at the Denver affair even if it means mortgaging *Rocks and Minerals*. Somebody must have tipped him off that we enjoyed the Convention for the booking is a complete surprise to us.

We approve this gift—who else will duplicate it?

Editor R. & M.

After seeing the little item in the December, 1947, issue of *Rocks and Minerals*—"Scientific Books for Finland" (p. 1129), I sent all of my last year's copies of *Rocks and Minerals* to the Finland Legation at Washington, D. C., to be forwarded to the Techical Institute in Finland. I received a nice letter from the of *Rocks and Minerals* to the Finland my contribution and interest in the needs of the Institute of Technology and saying that he is certain the publications will be of interest and will be gratefully received.

I am just wondering if *Rocks and Minerals* was ever sent to Finland before.

Mrs. Lillian Wirsula
Winsted Conn.

Jan. 27, 1948

Fuller's Earth

Fuller's earth is a variety of clay whose composition is not thoroughly determined but consists chiefly of hydrous aluminum silicate. It possesses the property of decolorizing oils and fats, by retaining the coloring matter and is used chiefly in bleaching oils and fats and in making wall-paper pigment.

Fuller's earth has been known for over one hundred years. It was formerly used in the fulling of cloth whence its name. Fulling was an operation by which fabrics made of carded wool were shrunk, thickened and partially felted. In the manufacture of cloth, fuller's earth was formerly much used in the cleaning of wool on account of its great power of absorbing grease and oil, when it forms a kind of earthy soap.

The clay is found in many parts of the world. Very good deposits are found in many parts of England, on the continent, in many states of the U. S., and elsewhere.

The clay is generally greenish-brown or greenish-gray in color.

Best Magazine on Subject.

Editor R & M:

Inclosed postal note for two years extension. The magazine was fully worth the $1.00 per year then and now you may be congratulated for making *Rocks and Minerals* the best magazine on the subject and still is worth far more than the price.

William C. Chandler,
Dec. 5, 1947 San Jose, Calif.

Vietzke—A Tough Rockhound!

A well-known Rockhound, Werner J. Vietzke, of Rapid River, Mich., who has been ailing with a dislocated vertebra, is able to be about his business on a part-time basis.

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FEBRUARY 1948

MYSTERIOUS GIANTS OF THE DESERT

By CHARLES PACKARD
1612 North Hill Ave., Pasadena 7, Calif.

Towering like giant kings over a domain of blistering hot, salt encrusted wasteland, stand the tufa Pinnacles of Searles Lake, California—the strangest unsolved mystery of the American desert.

Our approach is heralded, for the first five miles, by a crackling sound as the wheels of the car break the salt crust covering the lake bottom. Still closer the salt crust gives away to a black shining mat of basalt broken into tiny fragments which tinkle like a million tiny bells.

At close range the Pinnacles appear to jut straight out of the ground like fingers pointing to the sky, some short, some two-hundred feet high. With our heads tipped back on our shoulders looking up to inspect the towering crags they assume as many different shapes as there are individual pinnacles. Their dirty white color with overtones of gray-purple stand out in sharp contrast to the deep blue of the clear desert air. On close inspection they prove to be porous and sound hollow if struck with a rock or pick.

The very nature of these eerie monsters elicit speculation as to what might be their origin. Study of the area's past history uncovers some facts and a great deal of personal guesses by geologists.

We know that high up on the rocky slopes of the mountains, which form the basin, may be seen three distinct shore lines marked by deposits of tufa; this indicates that at one time this dry desert lake was a lake in fact as well as name, for a few thousand years ago Searles Lake covered about four-hundred square miles.

Today the residue covers about twelve square miles. The depth of the deposit of salt is from seventy feet increasing to over one-hundred feet in thickness at the center of the lake.

Experts disagree as to how the water got there in the first place. Some hold that Owens Valley overflowed the divide at the south end, flooding a succession of lower basins, eventually the waters rose in the Searles Basin to such a height that all three valleys in the area were submerged in one continuous body of water.

Other opinions are: it was the result of the melting of glaciers which raised the water level all over the world, still others say that springs and mountain runoff was sufficient and again some believe it might be the result of ocean water which periodically covered the west coast from time to time in the distant past.

Regardless of which expert you go along with, all do agree that the Pinnacles were formed at a time when the basin was more or less filled with water high in salt content.

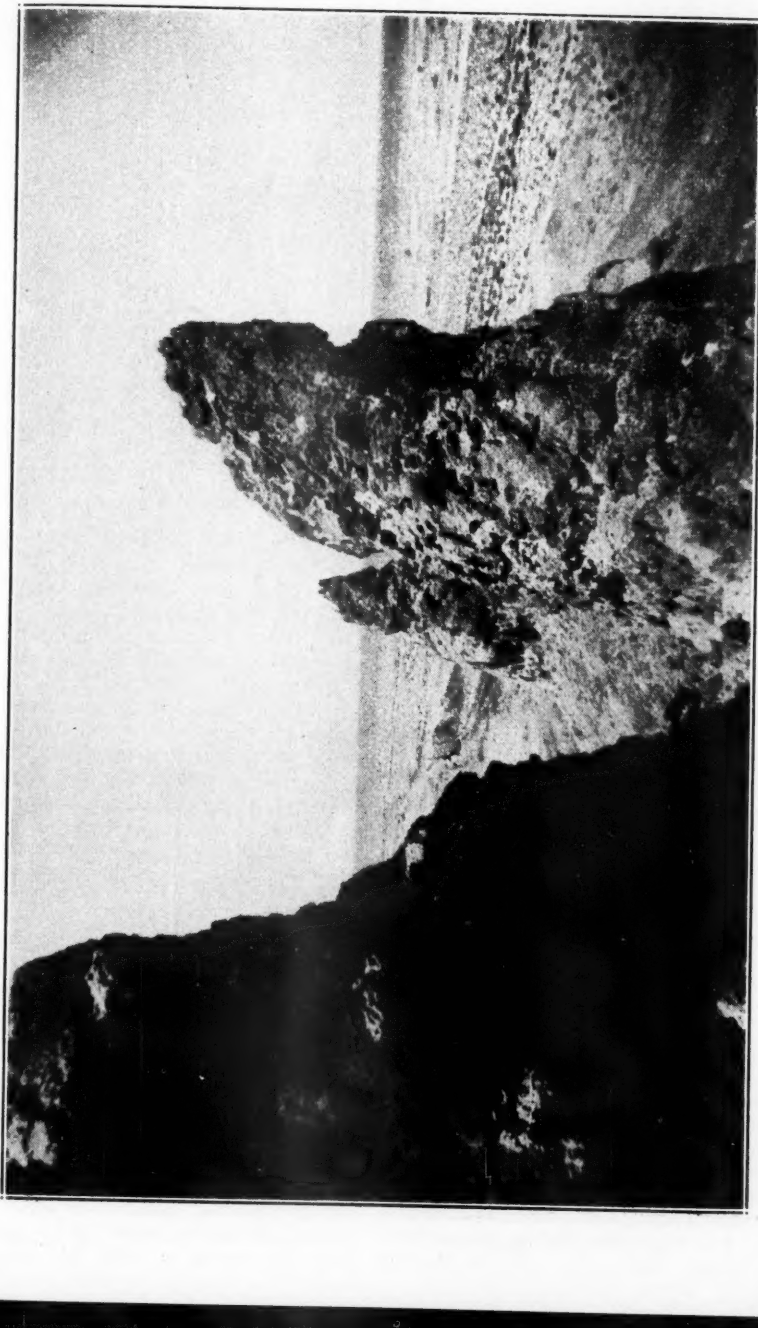
Today we cannot say for sure how these huge monuments developed in this prehistoric lake for here again the geologists do not agree among themselves.

In reconstructing the scene we take the few scraps of known information and assemble them piece by piece into what appears to be a logical order, then with our knowledge of geology and a liberal sprinkling of imagination and an adventurous spirit we speculate on what the missing bits of information must be.

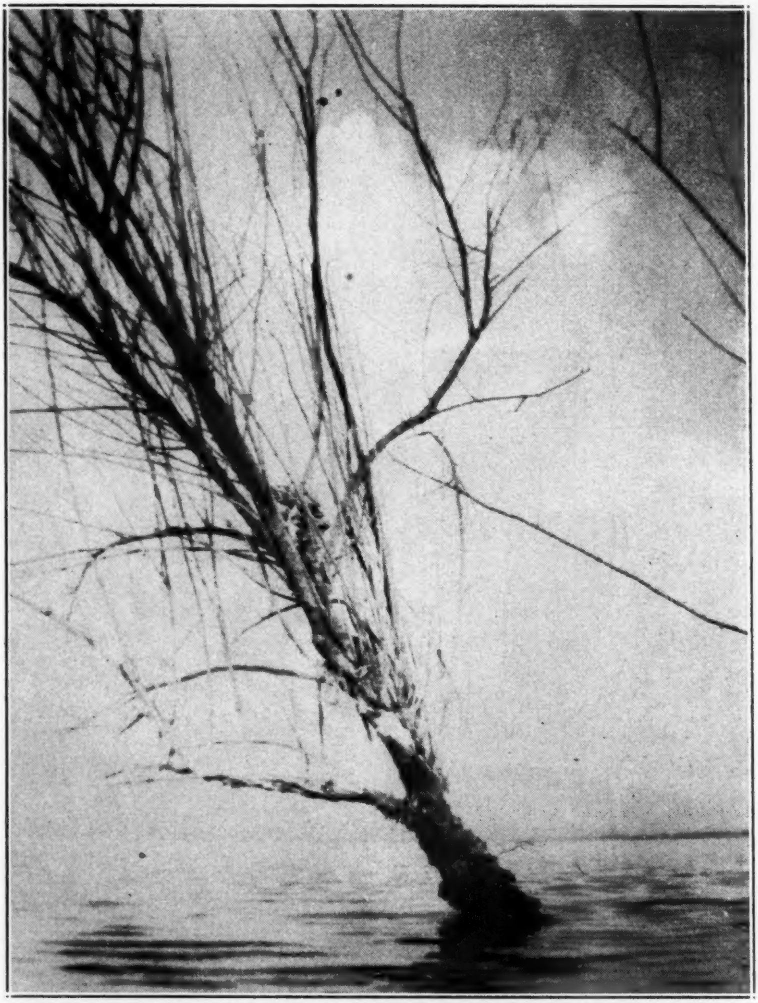
The first serious study of the Pinnacles in Searles dry Lake was made by Hoyt S. Gale and reported in the United States Geological Survey bulletin, number 580. In this bulletin Mr. Gale weaves together this picture for us.

Quietly and slowly, at a time long before man had disturbed the serenity of this valley, a spring bubbled its way merrily up through a crack in the earth at the bottom of the lake. But this was no ordinary spring, for it collected in its journey up

View from top of a pinnacle. Note size of car in bottom center of picture.



Close up of a pinnacle.



Tufa forming in Salton Sea, California.

through the ground a strong solution of lime. This lime, speculates Mr. Gale, mingled with the stronger water in the lake, slowly began to make itself manifest by evaporation and slowly the lake began to shrink exposing these accumulated deposits of brine. The bright sunlight and the wailing winds set to work drying and bleaching until they became as hard as stone. This is the way we see the Pinnacles today.

Other men put the story together differently.

They see this gentle bubbling spring as a hot spring rising from an old earthquake fault, imparting its warmth to the surrounding lake water. In this genial climate spawned millions of algae collecting around the mouth of the spring and very slowly, in coral like fashion,

Twig covered with tufa, Salton Sea, Calif.

began the building of their gigantic monuments. The saline content of the lake water naturally rose as the level of the lake declined, collecting on the mounds of algae forming a tufa crust and drying and hardening as it became exposed to the bright desert air.

Continuing our speculation on the origin of the Pinnacles we are confronted with a theory the least held by the geologists, yet one of the most plausible. Could these lone spires standing in a flat salt basin be the remnents of fossil kelp or sea weed?

Giving this theory the detective's third degree we note some interesting similarities. A desert company investigating the Pinnacles for commercial possibilities drilled a hole to the center of a likely spire, there they found a stemlike core of pure calcium carbonate or chalk. This calls to mind the fact when vegetable matter decays it gives off carbon dioxide—in an alkaline solution, such as the Searles Lake water, this causes the precipitation of the calcium carbonate, hence the stemlike core.

Other interesting similarities are: the Pinnacles reach a height of roughly two-hundred feet, this checks with the fact that kelp grows that high in the Pacific Ocean and added to that it is believed the original Searles Lake was of fresh water origin, to this we add we know of fresh water kelp. To extend our investigation, algae have been found in the tufa, to this it is logical to assume the kelp would attract the algae for the sake of the food.

And so the arguments go, all logical, yet none conclusive.

If we are to seriously pursue the origin of the Pinnacles we must not overlook the possibility that the same process might be going on today. Three leads seem to be worthy of consideration: the Salton Sea, Pyramid Lake and Lahontan Lake for here we find recent tufa in the making.

Along the arid shores of the Salton Sea the tufa has formed only where it could find firm support, such as on a few partially submerged volcanic hills, elsewhere on the shores and on the bottom of the lake we find only soft mud. When these tufa bearing twigs are first taken from the water the surface is soft, gelatinous and dark greenish-grey in color. As it dries and hardens it turns white.

J. Claude Jones, author of Quaternary Climates, reports that on examining the dried material of the Salton Sea, under a hand lens, he found that the surface was partly covered with a mat of the free ends of loosely interwoven algae whose base was buried in the tufa. By separating the algae from the tufa, in a weak solution of acetic acid, they were identified as blue-green algae.

Mr. Jones concludes his report with another riddle. The deposition of tufa must be due to some other cause than simple supersaturation of the lake water with calcium.

If that be true, could it be the tiny algae built those huge Pinnacles? Some authorities believe so, for it is known the algae associated with tufa produce deposits of calcium in other locations.

This seems to add weight to our second and third theories on the origin of the Searles Lake Pinnacles. We speculated that the algae, coral like, collected around the bubbling hot springs at the bottom of the lake and also that the kelp attracted the algae as well as offering a firm sup-

port for the tufa.

Continuing our geological sleuthing of recent tufa we turn to the southern edge of Nevada's Smoke Creek Desert or twenty-six miles north of Reno, to Pyramid Lake, one of the few remaining pools of the great Quaternary Lake Lahontan which once covered northern Nevada and northeastern California. It is here we find, when the water level drops, grayish paper like bands of tufa clinging to the rocks which project out of the water and along the beaches. In addition to the recent tufa, in a very limited area at the head of a small bay there is a group of feeble hot springs bubbling forth their saline waters and emptying directly into the lake. Around the mouth of these springs have formed tubules of calcium carbonate standing about six inches high and three inches in diameter.

From Pyramid Lake we move south and east to a shimmering hot expanse of salt and sand almost completely devoid of any living thing. The Lahontan Lake we see today bears little resemblance to its eight-hundred and forty square mile prehistoric ancestor. Here the tufa clings to pebbles producing lace like forms one to two feet in diameter and where there is a firm foundation continuous layers of tufa have been deposited up to three feet in thickness.

A cross section seen under a lens is a perfect reproduction of the cross section of the stems of Chara, an algae that is still growing at depths of from eighteen to twenty feet in the present lake.

What does this all add up to, you probably ask!

First; here is a mystery as baffling as any the desert has to offer and second it is a real challenge to the imagination and the four-thousand years, more or less, of man's accumulated knowledge.

Projecting themselves high into the cloudless desert sky stand the shaggy tufa Pinnacles completely aloft and with seemingly absolutely no relationship to the barren salt flats surrounding them. We know what they are—but from whence they came nobody knows.

CHICAGO MUSEUM TO CONDUCT FOUR GEOLOGICAL EXPEDITIONS IN 1948

The Chicago Natural History Museum, Chicago, Ill., has the following expeditions scheduled for 1948:

Prehistoric Reptiles

Dr. Rainer Zangerl, curator of fossil reptiles, accompanied by several students, will dig for specimens of prehistoric reptiles and amphibians in an essentially unknown formation, the Alcova of central Wyoming.

Fossil Invertebrates

Eugene S. Richardson, curator of invertebrate fossils will collect invertebrates of the Ordovician period (an era of some 450,000,000 years ago) in the mountains of Pennsylvania.

American Geology—West

Dr. Robert Kriss Wyant, curator of economic geology, and Harry Changnon, curator of exhibits, will make an economic geological collection of ores in the Black Range Mountains in New Mexico. They will also assemble specimens relating to physical geology.

American Geology—East

During the summer Dr. Sharat K. Roy, chief curator of geology, will continue the systematic field study, in which he has been engaged for a number of years, of the basic igneous rocks found in the Adirondack Mountain areas of New York state; also New Hampshire and possibly Massachusetts.

Surely Needed It!

Editor R&M:

Many thanks for calling my attention to "How to collect minerals" as that is just what I have been looking for. Being a beginner, I surely need it.

Am enjoying each issue of *Rocks and Minerals* from "Kiver to Kiver".

Oliver A. Mason,
Ogden, Utah.

Dec. 12, 1947

VICINAL FORMS ON GARNETS

By JOHN N. TRAINER

Crystallographers have observed that practically all natural crystal faces of minerals have markings in a variety of designs and they have grouped them into striations, etchings, accessories and vicinals. Nature leaves most of the polishing to man.

Vicinals are lines at the edges or covering the entire faces of crystals and they are visible but not tangible. See the accompanying illustrations.

Webster says that the word vicinal is derived from the Latin word from which the English word vicinity is derived *and* that mineralogically it designates subordinate forms or faces on a crystal.

Accessories, as described by Dr. Pough in a paper on phenacite, are irregularities or deviations on crystal faces such as depressions but more commonly elevations, pits and hills, terraces, low pyramids and hillocks. They may be growth or etchings and are dotted over a surface but not the whole face. They can often be felt by the finger and seen by the naked eye or they give a signal on the reflecting goniometer. It is not easy to distinguish between the "low pyramid" accessory and vicinal forms.

What is the genesis of vicinal forms and other abnormalities on crystals? How account for them? There is considerable literature on the subject, more in connection with other minerals than garnets, and differences of theories and explanations. In the first place, the causes can be divided roughly into external and internal with the emphasis on internal. Etching is an example of an external influence; striations, vicinals and accessories of internal. Striations are sometimes due to oscillatory combinations of planes in the formation of crystals such as in quartz and to repeated twinning such as in albite. Accessories are due to the nature of the solutions and of the growth.

As to vicinal forms, the most recent explanation of this interesting phenomenon has been expounded by Tutton and others. They are intimately connected with the crystal structure and the molecular space lattice of the mineral under consideration. There is a directive molecular force, a current of concentration, that controls the crystal form which might, for instance, be a garnet dodecahedron. If in the cooling process, there is time and certain other conditions are favorable for an orderly arrangement of the molecules, the crystals will have good normal faces of high reticular density, that is, with the points of the lattice most thickly strewn but if the crystallization is relatively rapid there is less chance for the molecular face to attain its ultimate objective. Water and other particles will not entirely escape. The faces will have a low reticular density, the points being more widely separated resulting in vicinal forms and other irregularities. Trapezohedrons and hexoctahedrons will be outlined or "indicated" on a dodecahedron of garnet.

It has been demonstrated in the laboratory that perfect crystals of alum with clear smooth faces can be produced if grown slowly with feebly supersaturated solutions, under restful conditions, protected from air currents and from earth and other tremors; otherwise vicinal and other irregularities will appear on the faces. In nature crystals rarely, if ever, have the advantage of these ideal conditions.

The classical example of vicinals on a garnet is the hexoctahedron on dodecahedrons of topazolite from the Ala Valley in Italy. They are characteristic of this Ala mineral. Gaubert says all topazolites show them. If any collector has specimens from the Ala Valley or Wurlitz in Bavaria, he may find it interesting to examine them.

The writer's specimen from Ala, 3½x 1½x1",has many small dodecahedrons on a serpentine matrix, averaging one sixteenth of an inch on the long axis. They are mostly the color of topaz but a few are green. Nearly all of them show the vicinal hexoctahedrons on the (110) face of the dodecahedron as lines parallel to the two axes crossing each other at right angles as shown in Figure One. The lines

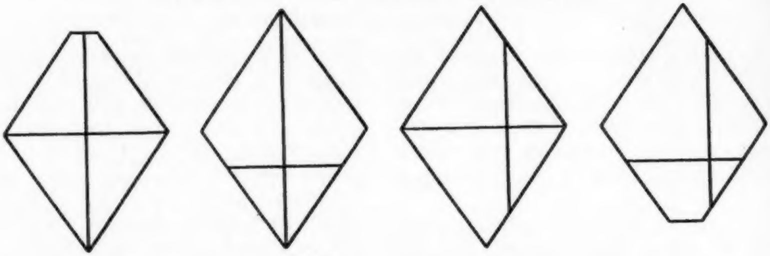


Figure 1. Enlarged drawings of typical vicinal hexoctahedrons on dodecahedral faces of topazolite garnets from the Ala Valley, Piedmont, Italy. Specimen in writer's collection.

cross at many points on the faces but only four typical cases are shown in the illustrations. Lines crossing at exactly the centre of the face are rare at Ala. (If there is only one line parallel only to the short axis, a tetrahexadron would be indicated but there are none such on the writer's specimen.)

The lines can be seen by the naked eye but are best seen in reflected light with a lens or a microscope. They are only lines; are visible but not tangible but are occasionally detected by the reflecting goniometer. The face of the dodecahedron is a smooth surface under which the lines can be seen. These lines might be called a blue print of one pyramid of the hexoctahedron but they are not structures. If developed into structures on every face of a dodecahedron, you would have the forty-eight faces of a hexoctahedron. The essonite from Ramona, California, is so developed in part and is a rare occurrence.

There are garnets from Brosso in Italy (See Figure Two) and from Vascau in Romania which show several vicinal hexoctahedrons on a single face of the dodecahedron instead of only one covering the entire face as at Ala, Italy. All the lines cross at the center of the faces.

The writer has examined the crystal surfaces of all his garnets from over four hundred localities and has found only four including Ala Valley which have vicinal hexoctahedrons, namely, those from Wurlitz in Bavaria, San Piero in Elba and San Benito County in California. He found seven tetratrisoctahedrons, thirteen trigonal trisoctahedrons, five tetrahexahedrons and many other irregularities. The vicinal hexoctahedrons are apparently the rarest.

The Bavarian specimen is a group of topazolite dodecahedrons covering an area of one and a half inches on a matrix of black serpentine. The crystals are a little larger than those from Ala Valley; on a few of them are the vicinal hexoctahedrons and in addition there are others showing tetrahexahedrons and striations.

On one of three spessartite dodecahed-

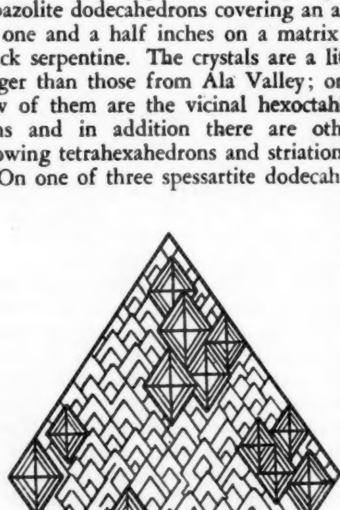


Figure 2. Vicinal pyramids of hexoctahedrons on dodecahedral face of a garnet from Brosso, Italy. Taken from Victor Goldschmidt's Atlas of Crystal Forms.

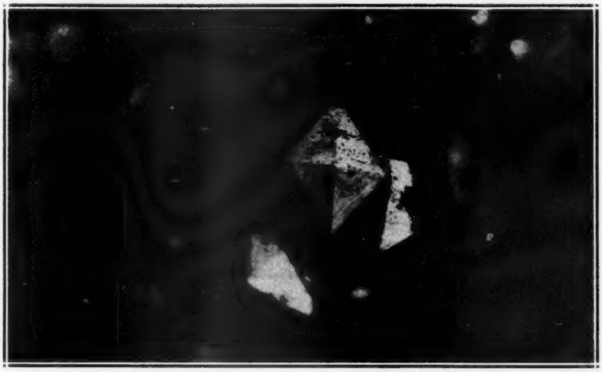


Figure 3. Photomicrograph, X-42, of a vicinal hexoctahedron on a dodecahedral face of uvarovite garnet from near Jacksonville, California. Specimen at American Museum Natural History. Photography by Thane L. Bierwirth of the Museum Staff.

rons on albite from Elba, one eighth of an inch on the long axis, there is a well defined vicinal hexoctahedron in a corner of the face which is exactly like one of the pyramids on the specimen from Brosso, Italy (See Figure Two).

The specimen from San Benito County, California, shows many small melanite dodecahedrons covering an area of 2¼x4" on a matrix of black serpentine, one of which shows a small vicinal pyramid like those shown in Figure 3.

Figure Three is a photomicrograph of the (110) face of a uvarovite crystal from near Jacksonville, California. The highlighted rectangle is flat and smooth but a vicinal pyramid of a hexoctahedron is sharply defined. The lines cross in the centre of the dodecahedral face. This is probably the first photomicrograph of this kind which has ever been made.

Vicinal forms are not confined to any one variety of garnet. The occurrences described above are on andradite (topazolite and melanite) spessartite and uvarovite and they have been reported on almandite and grossularite.

The seven occurrences of vicinal hexoctahedrons on garnet mentioned here are the only ones known to the writer to date and are so few that they can be considered rare and vicinal forms are an interesting phenomenon with much appeal to the imagination.

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Editor R&M:

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I have done business with quite a number of your advertisers and have been well satisfied.

George R. Moessner,
Los Angeles, Calif.

Jan. 10, 1948

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Banff, Alberta
Canada

Feb. 3, 1948

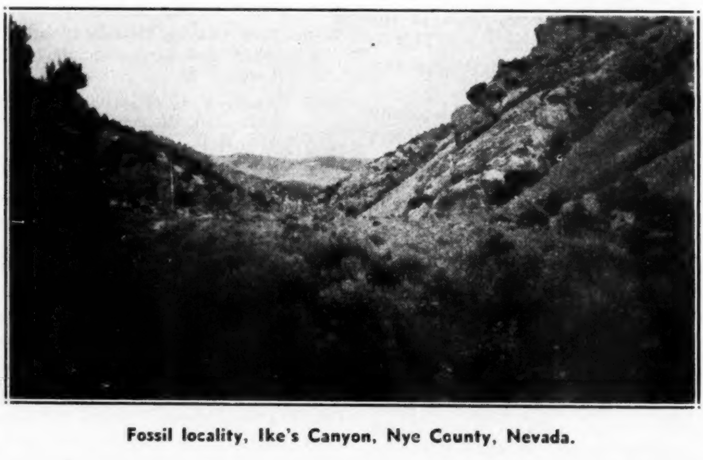
RAMBLINGS OF A ROCKHOUND

By R. F. HENLEY
4075 - 19th St., San Francisco 14, Calif.

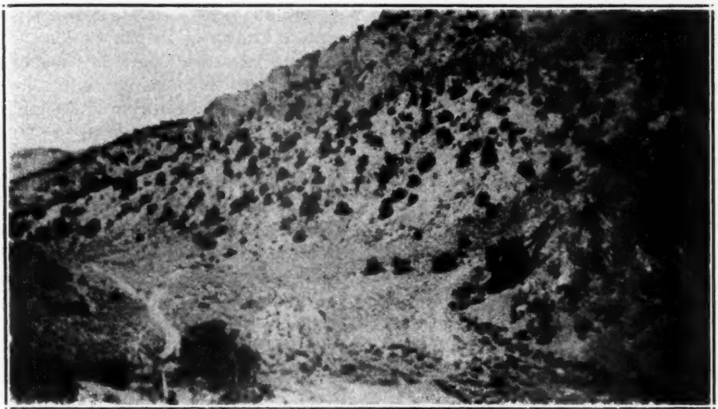
For the fifth consecutive year I have spent my vacation at a boys' summer camp as instructor to the boys in the lapidary art. Two years ago (1946), having recently retired at the age of 75, I was able to spend the entire months of July and August at the camp which is located near Portola, California, in the Sierras. It is known as "Grizzly Lodge" and accomodates 40 to 50 boys at a time. With a 13 acre private lake, a dozen horses, a rifle range and the whole county to roam over, it makes an ideal camp. Being located in a game refuge the deer are quite plentiful and when the hunting season opens the hunting outside the refuge is excellent. As to fish, during July almost every day one of the boys would bring in a rainbow trout from 12 to 18 inches long. And the way those boys went for stone polishing did the instructor's heart good. That year two of my pupils were Peter and Michael Barnato, grandsons of Barney Barnato, who two generations ago was known all over the world as the famous diamond king of South Africa and rival of Cecil Rhodes. In the contest for best work these boys stood second and third. The pet of the camp was "Susie", a fawn brought in by the forest ranger when only a week or two old. Not only was she very tame but sometimes too fresh especially when she poked her nose in my tent at 4.00 AM. However she soon learned that was the wrong tent and transferred her attentions to the cook's tent and would follow her down to the kitchen for her morning feed. Soon she was drinking two gallons of milk per day which was making rather expensive venison.

After the camp closed, August 29th, I started on a rock gathering trip and for a start joined up with a fossil collector and made my first trip gathering fossils. With beginner's luck I found three trilobites and some gastropods in a relatively new field, called Ike's Canyon, several miles south from Potts, in Nye County, Nevada. To reach this field we go through a big cattle ranch containing about 1200 square miles. All you have to do to keep from being lost is to stay inside the fence!

Then off to the rhyolite fields by permission of the owner where you drive right on top of the deposit about six miles off the highway on a fair desert road, get out of your car and start picking up pebbles. For massive stuff you go to a small quarry which has been opened in the hill close by and go to work with heavy tools. Some of this rhyolite, popu-



Fossil locality, Ike's Canyon, Nye County, Nevada.



Another view of the fossil locality, Ike's Canyon, Nye County, Nevada.

larly known as "wonderstone", contains beautiful patterns. It also often produces pictures and well matched slabs for butterflies, etc. In my cuttings I have a pair of crows, two black panthers, two foxes, also a pair which when put together suggest an old man and an old woman gazing into a big earthen pot. This I have entitled "What's cooking?" Then there is a slab which looks like nothing so much as an Arab's profile with turban and long flowing robes. The rhyolite fields are in Churchill County, Nevada about 15 miles east of Fallon. To reach them you go about 12 miles southeast of Fallon, on U. S. 50, then about 6 miles northeast on a desert road through the sage brush.

Next stopping point was Luning, Nevada, where I did some trading with a local man who runs a service station while his partner works some jointly owned mining claims in the hills. I obtained some of what I term brecciated quartz running through various shades of pink to red with what I think is streaks of calcite which although it under cuts when polishing is also fluorescent and also there are spots of malachite, azurite and native copper

Rhyolite Hills, Churchill County, Nevada.
"White" hill on left, "Red" hill on right.

sprinkled through the stone. Altogether about the most profusely colored stone I have seen.

About 4½ miles east of Henderson, Nevada, (a few miles south of Las Vegas), I visited an outcrop of green jasper but missed the most attractive deposit which is on the other side of the highway. Its location I am told can be ascertained from the gate keeper at the big manganese plant near by and that is something to look forward to for a future trip.

Then over into California and the Mojave Desert with the temperature 100 in the shade but by eating light and drinking heavy and dressing light it was not distressing in the least; in fact I liked it. About 40 miles east of Barstow there is a place known as Pisgah Crater and there is some attractive agate and jasper to be found here but being within striking distance where the rockhound tribe is very numerous this area has been much picked over and one has to look carefully to gather good material.

Next stop, before returning to my home in San Francisco, was at Grieger's, the mineral dealer in Pasadena, who is known to all the rockhound fraternity and where I did some buying of choice material.

Altogether it was an enjoyable trip and one which could be repeated with just as much pleasure as the first time.

BIBLIOGRAPHICAL NOTES

The Mining Industry of the Province of Quebec in 1945*:* A review of the mining industry which covers metals, non-metallics, and building materials.
6½x9¾, 176 pages.

Siscoe Mine Map-Area: by P. E. Auger. A geological report on the area adjacent to the Siscoe gold mine and an outline of the exploration and development work that has been done on the mining properties of the district.
6¼x9¾, 40 pages with map.

Desvaux Lake Area: by P. E. Auger. A geological report of part of the gold belt near Rouyn.
6¼x9¾, 24 pages with map.

The above three bulletins are issued by the Quebec Department of Mines, Quebec, Canada.

The following papers have also been received:

On the Astronomical Dating of the Earth's Crust: by Harlow Shapley.
pp. 139-150.

Fluorine in United States Water Supply: by Anastasia Van Burkalow.
pp. 207-222, 1 plate.

The Birth of Paricutin: by Jenaro Gonzalez R. and William F. Foshag.
pp. 223-234, 10 plates.

The above are from the Smithsonian Report for 1946, issued by the Smithsonian Institution, Washington, D. C.

Geological Notes and History of the Pequea Silver Mine, Lancaster Co., Penn: by Richard M. Foose and John W. Price.
pp. 53-63, 1 fig.

From Proceedings of the Pennsylvania Academy of Science, Lancaster, Penn.

Field Tests for the Common Metals (9th ed.): by George R. Fansett. This pamphlet has been written in simple and non-technical language, especially for the beginner.
6x9, 56 pages—35cents a copy.

Published (as Bulletin 154) by the University of Arizona, Tucson, Arizona.

Wants More Pennsylvania Articles!

Editor R&M:

I was *very, very* pleased with the issues received this year. These all contained many articles of interest on Pennsylvania localities, especially on the Kibblehouse quarry which I have visited several times and where I obtained some very nice specimens for my collection. I hope you will continue to print articles on Pennsylvania localities for years to come.

I think *Rocks and Minerals* is the best mineral magazine in the country. It contains many crisp articles which hold everyones interest.

Bill Knight,
Merion, Penn.

Dec. 30, 1947

Watauga Dam, Tennessee, Under Construction

Watauga Dam, huge TVA project now under way in the Great Smoky Mountains of Eastern Tennessee, constitutes a tremendous engineering and earthmoving feat in which trucks and tires perform a major role.

Located on the Watauga River (Tennessee River tributary) a short distance from the city of Elizabethton, actual site of the project appears in photograph. Specifications call for a dam 325 feet high, built entirely of earth and rock fill. Estimated cost is approximately $30,-000,000. When completed the dam will be one of the highest of its type in the United States. Flood control, low-cost electric power and recreational facilities for inhabitants of this area are main purposes of the enterprise.

In order to complete the project by late 1948, the goal set by TVA officials and contractors, it is estimated it will be necessary to move 12,000 to 15,000 cubic yards of earth and stone daily during good weather. This is accomplished by literally moving mountains, some of which are blown into fragments by high explosives with resulting loose earth and rock hauled away by Diesel-powered Euclid dump trucks.

Fifty-two of these Euclids (both bottom and end dump) are currently at work on this job, in addition to approximately 100 other trucks of all types. Tires used on these trucks must be dependable—rugged enough to withstand the punishment administered by rough terrain, sharp stone and heavy loads. For this reason many of the trucks are equipped with Goodyear Hard Rock Lugs, designed for heavy, rough, off-the-road operations.

Elizabethton, a little city of about 10,-000 pop., is in the western part of Carter County, in northeastern Tennessee. A number of minerals, including brick clay, are found near the city. Bauxite, brick clay and pyrolusite have been mined; pyrite has also been mined but it occurs 12 miles northeast of the city on Stony Creek where it is found in black shale.

Site of Watauga Dam near Elizabethton Tenn.

NEW MINING LAW PROPOSED FOR NEW YORK

AIBANY, Jan. 21.—Discoverers .of silver or gold mines on New York State lands must pay the state a royalty of two percent annually of the market value of the minerals, under the terms of a bill now pending before the Legislature. If gold or silver mines are discovered on private lands, the discoverers would be exempt from royalties to the state for a period of five years, after which a one percent annual royalty would be levied.

The bill, offered as an amendment to the public lands law, is sponsored by Assemblyman Wheeler Milmoe and Senator Fred G. Moritt of the Joint Legislative Committee on Interstate Cooperation. A hearing on the measure will be held later in the session of conferences with mining interests and others affected by it indicate the necessity for it, Assemblyman Milmoe said today.

The bill modified existing provisions of the public lands law by reducing from 21 to 5 years the period during which discoverers of gold or silver on private lands are permitted sole benefit of the minerals without royalties to the state.

A second important provision of the pending bill would permit termination of the rights of those filing mining claims if they fail to submit reports to the Secretary of State when due, or pay royalties, if due.

The proposed legislation carries forward a program sponsored in 1945 by the Interstate Cooperation Committee to encourage exploration and mining activities in the state. At that time, in part as the result of the wartime pressures, New York State had become one of the important mining states of the Union. Mining operations were hampered, however, by existing statutes which permitted prospectors to file claims or "notices of discovery" with no limitation on the lands covered and no responsibility for working the claims.

The result was that in periods when mining was booming, such as the Yukon days, as many as 3,000 mining claims were filed in New York State in a single year, and one prospector boasted that he had filed on everything from the Hudson to the St. Lawrence. Thousands of claims were unworked and some had remained dormant since colonial days.

The Interstate Cooperation Committee, under the leadership of Assemblyman Harold C. Ostertag, its chairman, sponsored legislation in 1945 which required that these long-dormant mining claims be worked or they would lapse. It also prohibited filing of claims by non-owners on private lands. The legislation, which became law, also stipulates that filors must spend not less than $250 per forty-acre claim every 30 months on exploration or exploitation of their claims or they will automatically terminate. The bill now before the legislature, further clarifies the State's interest in silver and gold deposits, and also strengthens the provisions for termination of claims on state lands when unworked.

The public lands law specifically prohibits mining operations in the forest preserve, and provides that where they are undertaken on other state lands, the state must be reimbursed for trees cut down in connection with such operations at the rate of one dollar per tree.

Labradorite

Labradorite is a lime-soda feldspar which when it shows a play or colors is used chiefly as an ornamental stone or as a gem.

It was first found on the island of St. Paul off the coast of Labrador by Moravian missionaries. When specimens of this beautiful mineral first reached England, they attracted so much interest that collectors all over Europe sought to obtain one or more and paid as much as $100 for a single piece and this was over 100 years ago. Since then labradorites (named for the locality) have been found in other parts of the world but their beauty does not compare with that from Labrador, where it is still found in large amounts.

Labradorite has been called Labrador opal, Labrador feldspar, opalescent feldspar, etc.

THE RUDISIL GOLD MINE OF CHARLOTTE N. C.

By PETER ZODAC,

Editor, Rocks and Minerals

One of the many interesting mineral localities in North Carolina is the Rudisil gold mine which is located practically in the heart of Charlotte, the largest city in the Carolinas. It was our good fortune to visit the locality, on March 11, 1938, when the mine was in operation, to which we were guided by the Rev. Robert B. Owens, of Charlotte.

Location

Charlotte is in approximately the southern part of North Carolina (in the southern port of Mecklenburg County).

The Rudisil mine property is along S. Mint Street (a few blocks south of the post office). The vertical shaft (the mine's only entrance) is 300 feet east of S. Mint Street and its headframe stands out distinctly so that it can be seen between the houses which surround it on all sides. Apparently the mine property takes in a whole block.

The mine offices, at the time of our visit, were in the frame building bordering the east side of S. Mint Street.

The mine has been abandoned for the past 8 years, the shaft sealed up, and it may be sometime before it will be worked again, if ever. Years ago it was one of the richest gold mines in the state—millions having been taken out—but as depth was reached the ore became poorer and much more difficult to work.

Mineralogy

Among the minerals found on the small dump near the shaft, at the time of our visit, were the following:

Bornite: occurs massive, in quartz.

Calcite: grayish massses in chloritic schist.

Chalcanthite: the mine foreman told us that the mineral exists as greenish-blue stalactites in old workings of the mine.

Chalcopyrite: yellowish metallic masses, with pyrite, in quartz—sometimes as attractive specimens. Chalcopyrite and pyrite are both gold-bearing and they are the ores of the mine.

Dolomite: white crystalline masses on quartz; it weathers brown.

Graphite: tiny lustrous black flakes in dolomite.

Limonite: brownish stains on rocks.

Malachite: greenish incrustations as alteration of chalcopyrite,

Melaconite: black earthy incrustation on chalcopyrite, being an alteration of same.

Prochlorite: forms dark green chloritic schist. Occurs also as dark green crumpled plates in dolomite.

Pyrite: is the chief gold ore of the mine. Commonly is is massive, often associated with chalcopyrite, and forms stringers and small veins in smoky quartz. Also noted as tiny pyritohedrons in vugs in quartz.

Quartz (Smoky): massive; is the gangue of the ore.

Serpentine: greenish masses with dolomite.

Talc: small greenish masses in smoky quartz.

Acknowledgment

The grateful thanks of the writer are extended to Rev. Robert B. Owens, a R.&M.A. member of many years, for the many courtesies extended to us.

Stanley Field Again Heads Chicago Museum

For the 40th consecutive time, Stanley Field has been re-elected president of Chicago Natural History Museum at the annual meeting of the institution's board of trustees, it is announced by Col. Clifford C. Gregg, director.

All other officers who served in 1947 were re-elected. They are: Marshall Field, Chicago publisher, first vice-president; Albert B. Dick, Jr., second vice-president; Samuel Insull, Jr., third vice-president; Col. Clifford C. Gregg, director; Solomon A. Smith, treasurer, and John R. Miller, assistant secretary.

QUARTZ

(Inf. Circular No. 32 (Dec. 1, 1947), Bureau of Mines, San Francisco, Calif.)

Quartz is the commonest mineral known. It is also one of the most variable as to form, color, and mode of occurrence. The earth's crust has been estimated to be about 12 percent quartz. Because of great abundance and useful physical and chemical properties, it is one of the most universally used minerals. Quartz is composed of silicon dioxide (SiO_2) plus varying amounts of included and combined impurities. Presence of gaseous, liquid, or mineral inclusions is characteristic of quartz crystals, although they may be flawless or nearly so. Quartz is colorless and transparent when pure but, because of impurities, may be any color (or combination of colors) and opaque. Quartz is divided into two major classes—crystalline or vitreous, and cryptocrystalline (minutely crystalline or microcrystalline). The former type has a hardness of 7 and sp gr of 2.6. Cryptocrystalline varieties have similar hardness but may be heavier or lighter depending on microstructure and type of impurities present. Quartz has no cleavage; usually exhibits conchoidal (shell-shaped) fracture; and has vitreous to greasy luster. It is chemically inert, being soluble only in hydrofluoric acid and (slowly) in a few strong bases. Large well-formed crystals are common in veins, pegmatites, and cavities in many kinds of rocks. Single crystals tons in weight have been described from several localities.

The varieties of quartz are almost countless. In general, the color, texture, structure, and kind of mineral inclusion determine the variety. Rock crystal, citrine amethyst, sapphire quartz, and rose, milky, sagenitic, and aventurine quartz are vitreous varieties. Chalcedony, onyx, agate, jasper, touchstone, flint, chert, hornstone, siliceous sinter, carnelian, prase, plasma, sard, and chrysoprase are all cryptocrystalline varieties. Quartzite is a metamorphic rock composed of quartz sand so firmly cemented by silica that breakage occurs as readily through the grains as around them.

Quartz for commercial purposes may come from sand deposits, sandstone, quartzite, vein quartz, and pegmatites. It occurs in every county in California and has been produced from most of them for one purpose or another. Aside from the quartz which is a major component in sand and gravel used for aggregates, the major California output is in silica sand. Hundreds of thousands of tons of this material are marketed annually for many purposes. Contra Costa, Amador, Monterey and Los Angeles Counties are leading producers. Minor quantities of gem quartz (which includes some optical quartz), pebbles for grinding mills, and crystalline quartz, for refractory and ceramic purposes have been mined in California from time to time. Quartzose building stones (sandstone, quartzite, etc.) are marketed discontinuously as demand arises—mostly for decorative facings in large buildings.

Unconsolidated quartz sands are mined principally by surface mechanical methods. Quartz sand derived from sandstone may be quarried or even mined underground when the amount of overburden becomes too great. Some Missouri deposits of this type are mined by simple room and pillar practice. Sands for concrete aggregates are usually screened to specified particle size limits and are often washed to remove fine constituents. Quartz crystals are most often marketed as a by-product in exploitation of other minerals. Salable crystals may be found in vein deposits, placers, and pegmatites.

The variety of uses to which quartz is applied is almost infinite. Silica sands are utilized in manufacturing glass, several types of fillers, refractories, plaster preparations, sodium silicate, natural abrasives (including sandblasting sand), molding sand (in the casting industry), artificial abrasives (silicon carbide), filters, deoxidizing agents (ferrosilicon), and engine sand. Silica sands, for most purposes, must contain less than 5% impurities. Glass sand should contain less than .05% of ferric oxide unless it is to be used in colored glass. Some sandstones may be crushed into sand for the above purposes. Others may be shaped

into building blocks and mill lining blocks; made into grindstones, pulpstones, and whetstones; or cut and polished for ornamental facings. Quartzite has been used for refractory and fluxing purposes, grinding pebbles, tube mill linings, and in the manufacture of ferrosilicon. Quartz crystals for optical purposes and for cutting into "rock crystal" must be water clear and free from flaws and impurities. Optical quartz commands the best price in crystals over two pounds in weight and with two or more crystal faces showing growth lines. Smaller unoriented cryssals bring less price. The value of any gem material depends upon its beauty, rarity, and wearing qualities. Value of quartz for this purpose depends also upon texture, structure, arrangement of inclusions, and uniqueness.

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COLOR MICROSCOPY PROCESS SPEEDS IDENTIFICATION OF MATERIALS

CHICAGO—Microscopy in color, without the use of dyes or light filters, is now a reality.

The new microscopy technique, developed by Germain C. Crossmon, Bausch & Lomb Optical Company scientist, provides a speedier, more accurate identification of a *w*ide range of colorless, transparent substances, including drugs and minerals.

In a talk delivered here Dec. 30, 1947, before the Zoological Section of the American Association for the Advancement of Science, Crossmon termed the technique "dispersion staining" and showed color photographs of this sections of body tissue in which muscle fiber, blood vessels and fatty tissues appeared in bright contrasting colors.

Crossmon demonstrated that only standard microscope equipment is required to turn transparent, colorless objects to bright colors. By choice of the correct immersion liquid which is placed over the sample, each different material appeared a different color. Crossmon further illustrated his technique wth photographs of textile fibers, grains of glass and mixtures of minerals. In each case, particles of different composition were different in color.

The apparent magic by which white light on a colorless object produces color has a sound scientific explanation, Crossmon pointed out. The light from the microscope lamp is passed through a dark-field substage lens to strike the sample at a high angle. The sample is covered with a high dispersion liquid that matches the light-bending ability of different materials in the sample at different portions of the color spectrum.

Each material then scatters some of the colors present in the white light into the microscope where they are seen by the observer while other colors pass directly through the sample at such a high angle that they do not enter the microscope.

The new method is expected to increase use of the microscope in checking foods or drugs for adulteration or contamination, testing minerals or ores for impurities and textiles for fiber identification. Crime laboratories may try "dispersion staining" to decide if microscopic fragments of materials are identical or not. Its use is also foreseen in medical microscopy for studying the relative refractive index of body tissue structures. Use of dyes to stain tissues or bacteria probably will not be supplanted, Crossmon related, in those cases where absorption of the dye is a specific chemical identification of the material.

In all of the many cases where a mixture of transparent materials is to be studied with a microscope, the color contrast produced by "dispersion staining" is expected to make the work of the microscopist less arduous.

FLUORESCENCE AND PHOSPHORESCENCE OF MINERALS

By R. L. SYLVESTER
(154 Parkside Ave., Syracuse 7, N. Y.)

Presented to the Mineralogical Section of the Rochester Academy of Science.

The Mineralight is a very rich source of Ultra-Violet rays especially the short rays which have the greatest fluorescent effects on minerals and chemicals.

The explanation of fluorescence and phosphorescence is technical and involves a high degree of mathematics, but if we eliminate all technical details for the present and attempt to explain the problem in its main essentials we can secure a fairly good idea of how these phenomena are caused.

The only natural source of Ultra-Violet rays is sunlight. Ultra-Violet rays are invisible and are shorter than the visible rays. White light or sunlight is made up of all the visible colors and some invisible rays such as the infra-red and the Ultra-Violet, which might also be called light rays. One proof of the way sunlight is made up is the way it is broken up into its separate colors by a rainbow. These colors are always present in the same order in every rainbow—red, orange, yellow, green, blue, and violet.

The reason for the definite order is that each color of light has its own wave length assigned to it and therefore appears as the same location. Red is always on the outside of the rainbow because it has a longer wave length than the other colors. Orange light has the next shortest wave length to red but has a longer wave length than the yellow so the orange color is between the red and yellow in the rainbow. So all the way down the scale each color has a shorter wave length than the one before it. The last color we see is violet and of course it has the shortest wave length of all the visible light. But the rainbow doesn't really stop there for there are still shorter wave lengths that our eyes cannot see. Ultra-Violet light is one of these invisible colors. It is the very next one to violet. It is there even though we cannot see it.

Now the wave lengths from the sun are not measured by feet, yards or miles, but by a very small unit of measurement called angstrom unit which is one 4 billionth of an inch. The infra red rays of the sun are between 8,000 and 25,000 angstrom units. The Ultra-Violet rays are between 3,000 and 4,000 angstrom units. This unit of measurement is not one of intensity or amount but is the measurement of the wave length and the wave length determines the effect of radiation.

For instance, the rays at 8,000 angstrom units have a red color. Longer rays are invisible. Rays at 4,000 angstrom units are violet and shorter rays are invisible. Rays at 3,000 angstrom units are chemically active and form vitamin D in the body. They also have a fluorescent effect on a few minerals. These rays are called the "long" Ultra-Violet rays. The short Ultra-Violet rays are not found in sunlight and can be secured only from artificial sources such as Mineralight which emits "short" rays located at 2,500 angstrom units.

This mineral light is made up of a mercury vapor with colored filter made of gelatine. Gelatine is used because ordinary glass will not let Ultra-Violet light through while gelatine will. Incidentally, for that very same reason the tube inside the lamp which holds the mercury vapor is made of pure quartz instead of glass.

It is well known that all minerals are made up of atoms and each atom is composed of smaller particles such as protons, electrons, and neutrons, etc. The electrons are supposed to revolve around the nucleus and the simplified theory of fluorescence is that the ultra-violet which energy strikes the atom is absorbed in the electron, causing it to change its orbits around the nucleus. Once it has changed its orbit, it proceeds to lose its energy and return to its original orbit. This releases energy which comes to us in the form of light. The wave length of this light determines the color of the fluorescence. While the entire process of collecting energy, moving into new orbits, giving up the energy and returning to the original path

takes place in a very small fraction of a second, we only see the light while the substance is being exposed to the stimulus of the ultra-violet rays, and this is the phenomenon we call fluorescence.

Some minerals are much slower in their reaction, and the electrons remain in their unnatural orbits for an appreciable length of time. In such cases we continue to see the light after the ultra-violet light source has been removed. This is the explanation for the "phosphorescence" and illustrated by the minerals which glow after light is taken away.

The cause of fluorescence in many minerals is due to some kind of activating agent. For instance, most forms of calcite do not fluoresce but if a small amount of manganese is present in the calcite it will act as an activator and the calcite will fluoresce red.

The calcite from Franklin, N. J., has manganese varying from one percent to five percent with 3½% giving most brilliant results.

Uranium salts in various rocks have the same effect as an activator but in such cases the fluorescence will be green.

This simple explanation of fluorescence and phosphorescence is not technically correct but is near enough to give anyone an idea as to how fluorescence does occur. Minerals may fluoresce from one locality and not from another.

SCIENTIST DISCUSSES DIFFRACTION GRATINGS FOR SPECTROGRAPHIC ANALYSIS

NEW YORK—Increasing importance of diffraction gratings for spectrographic analysis as a substitute for prisms of optical quartz which is virtually unobtainable today, was the subject of a talk given here Jan. 6, 1948, before the Society of Applied Spectroscopists. The epeaker was David (No middle initial) Richardson, Bausch & Lomb Optical Company scientist and former Massachusetts Institute of Technology physicist.

One of the country's leading spectroscopists, Richardson discussed some of the problems involved in ruling gratings. Diffraction gratings are small optical surfaces ruled with 15,000 straight, parallel lines per inch. For proper performance each line of the grating must be accurate to better than one-millionth of an inch, a problem which has attracted the attention of physicists for more than a century.

Richardson illustrated his lecture with photographs of ruling engines and photomicrographs of grating surfaces. A description of the outstanding features of some of the ruling engines now in use in laboratories throughout the country was followed by a discussion of operating techniques required to obtain the necessary one-millionth of an inch accuracy emphasizing the shaping of diamonds used for ruling.

MOMENT OF SUSPENSE

By J. C. BOYLE

When I was elected to the Philadelphia Mineralogical Society in February, 1919, the membership—and consequently, the finances were much restricted.

To such an extent was there an actual financial stringency that when, at one annual get-together, we found we were possessed of the large sum of eleven dollars and some cents, one of our perpetual wits suggested we hire a well-known Delaware River excursion steamer, load it with a good brand of brew and 'take a day off'.

Well, this stringency in finances resulted in our using home talent (Club members) as speakers at our monthly meetings.

One of them, giving a talk on igneous action, found himself unable to recall the descriptive term 'juvenile' given to the water accompanying volcanic phenomena.

There was silent embarassment for several seconds until our aforementioned wit supplied, in a stage whisper, the omission with two words—"PLUTO WATER!"

The response was an instantaneous and volcanic outburst of laughter lasting several minutes, in which the speaker himself joined with reckless abandon.

NEW MICRO MOUNT

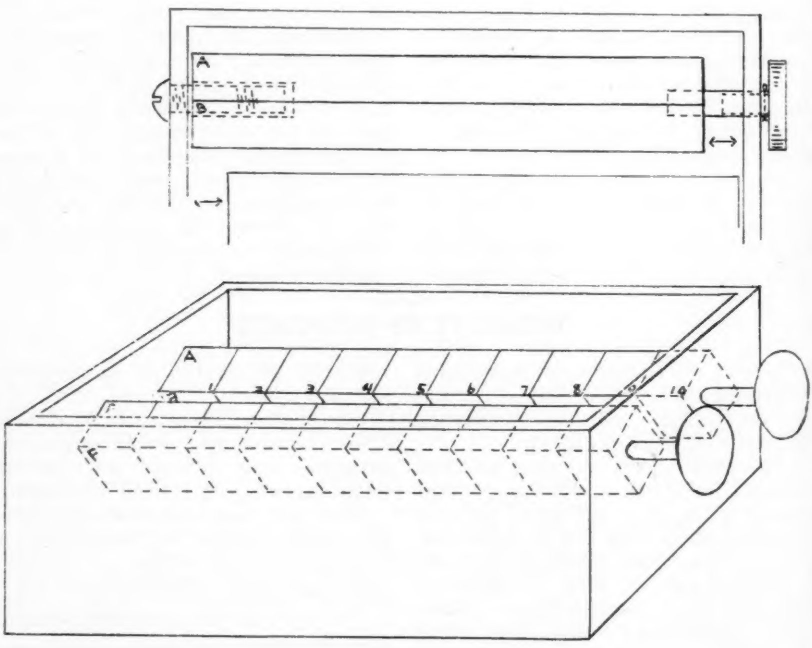
By JAMES A. TAYLOR

My prime interest is not micro mounts but I did have occasion to inspect the minerals of a certain mine grouped together. Perhaps I am too impatient to mount, label, and handle all that I found interesting in an infinite number of little boxes and besides the flat untiltable boxes do not allow you to peek around the corner of some amazing cavity or incline a crystal at a wanted angle without laborously tipping the mount. It is most interesting also to place together a large group of minerals of a certain class such as the copper minerals, the zeolites, etc.

The accompanying drawings are self explanatory. The revolving square "mount" is 5" long divided into ten rectangles by white ink lines each ½"x⅝". Each face is lettered, i.e., A, B, C etc. and each rectangle numbered i.e.: A-1, F-8 etc. The whole mount is revolved by the handle outside the box. Lateral motion is provided by pressing or pulling on the handle so that the whole mount slides easily from right to left or the reverse or the angle is changed with a minimum of trouble. With two mounts in the box, from 80 to 200 or more specimens can easily be mounted. A little Duco cement fastens the specimen to the wood securely.

The box has of course a cover (not shown). Inside this cover is secured a transparent plastic sheet into which the explanatory file cards are slipped. All the necessary data can be entered on these cards, i.e., A-7, Azurite, malachite, Copper Queen Mine, Bisbee, Ariz.

I found it desirable to make the box



The new revolving micro mount.

fairly heavy so as to prevent motion. The box is laid on the flat stage of the microscope. The mounts should be near the top of the box. The diameter of the end of the mount from corner to corner is 7/8" and the mounts are centered 1 1/4" apart giving ample clearance for mounted specimens. Into each end of the mount I inserted small brass tubes. The handle is fixed immovably inside the right tube by a cotter pin to provide for manipulation of the mount. The left end is supported by a 1/4"-20 thread, machine screw threaded into the wood (No. 7 drill hole). This screw may be withdrawn to permit insertion of the mount. The tube is slightly larger than the screw so that the mount will slide easily.

MONAZITE AND THE RARE-EARTH METALS

(Inf. Circular No. 31 (Dec. 1, 1947), Bureau of Mines, San Francisco, Calif.)

Rare-earth elements numbering 15 occupy positions 57 to 71 on the periodic table (see Demings General Chemistry, 5th ed). These are: lanthanum (La), cerium (Ce), praseodymium (Pr), neodymium (Nd), illinium (Il),) samarium (Sa), europium (Eu), gadolinium (Gd), terbium (Tb), dysprosium (Dy), holmium (Ho), erbium (Er), thulium (Tm), ytterbium (Yb), and lutecium (Lu). Most of these are still chemical curiosities but cerium, praseodymium, neodymium, and lanthanum have commercial value. Other useful rare metals such as thorium (Th), yttrium (Y), and radium (R) are found in rare-earth minerals making them doubly important. Because of limited space, these and the lesser rare-earth metals cannot be discussed here. For a description of the various metals consult the Handbook of Chemistry and Physics, 30th ed., edited by Charles D. Hodgman and published by the Chemical Rubber Publishing Co. at Cleveland, Ohio.

Monazite is, at present, the only important commercial source of rare-earth metals and thorium. Lindgren has suggested the formula (Ce, La, Y, Th) PO_4 for this mineral. The older formula (Ce, La, Di) PO_4 as given in the Dana System has been proved incorrect because of separation of "didymium" into neodymium and praseodymium. Most of the rare-earth metals are present in monazite in some degree. It is commonly honey yellow in color but may vary from greenish yellow through hyacinth red to clove brown. The luster is resinous, and transmission of light is poor. Sp gr varies from 4.9 to 5.3 and hardness from 5.0 to 5.5 Monazite is very brittle, and crystals and grains can be cracked between the teeth. It is magnetic enough to be concentrated electromagnetically in a strong field. Because of the presence of minor amounts of radium and mesothorium, monazite is nearly always radioactive. The crystallization is monoclinic.

Rare-earth metals have also been prepared from the minerals gadolinite, samarskite, euxenite, fergusonite, yttrialite, thorite, and allanite, but such minerals seldom occur in enough quantity to be profitably mined. These minerals are silicates, oxides, columbates, tantalates, and titanates of rare earth and other rare metals. With the exception of yttrialite, which is an olive-green to yellowish-orange mineral, they are brownish-black minerals with remarkably similar properties. When good crystals are absent, chemical and spectroscopic analyses are usually necessary for identification.

No commercial production of rare-earth materials has been made from California up to 1947. Minor occurrences of monazite, allanite, and other rare-earth minerals have been described, from time to time, in the literature on California minerals (notably from pegmatites in San Diego and Tulare Counties and from Sierra Nevada placers). U. S. production has come from placers in Idaho, North Carolina, South Carolina, and Florida. Unsuccessful attempts were made to mine "hard rock" deposits in North Carolina and Llano County, Texas. Brazil, India, and Ceylon have been the major producers since the first World War.

Mining methods employed in recovery of monazite sands have been principally simple sluicing or a combination of hydraulicking and sluicing. What little "hard rock" mining has been done has been by simple surface hand mining and hand sorting. Much of the Indian and Brazilian beach monazite was shipped as concentrated by wave action. Of late years gravitational and electromagnetic sorting of ores has become common practice. Gravity sorting may be confined to simple rejection of the lighter constituents such as quartz and feldspar or the ore may be more thoroughly separated on Wilfley-type shaking tables. Magnetic separation should be preceded by gravity concentration and thorough drying. Roasting is sometimes employed to increase the magnetivity of the ore. Careful sizing of concentrates is necessary in order to get maximum recovery during magnetic separation. The latter takes place at a series of tables of increasing electromagnetic strength. The current at each table must remain constant throughout the separation period.

Oxides of the various rare-earth metals are extracted from monazite by heating the mineral in sulphuric acid and fractionally precipitating them by several different types of bases. The metals are prepared from their oxides by both chemical and electrolytic means.

For many years the principal use for rare-earth compounds was in incandescent gas mantles. After replacement of gas illumination by the electric light, about half the production went into arc-light electrodes, one quarter into pyrophoric (spark producing) alloys and the remainder into miscellaneous uses such as mildew-proofing, ceramics, and glass. Since 1940 several new important uses for rare-earth minerals have appeared. Cerium has become an important constituent in some aluminum, magnesium, and iron alloys to increase strength and hardness. Radioactive materials for the production of atomic energy come, to some extent, from rare-earth minerals. Salts of rare-earth metals are used in optical glass, special colored glass, beauty preparations, opaline enamels, chemical catalysts and illuminating devices.

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Centennial Mining Representative

Appointment of a representative of the gold mining industry to the California Centennials Commission was sought Jan. 14, 1948, by the San Francisco Chamber of Commerce.

The Chamber also requested the issuance of a gold coin or medal to commemorate the national importance of the discovery of gold in California.

Bert Austin, chairman of the Chamber's mining committee, pointed out that while the gold mining industry has existed in this state since the discovery of gold in 1848, it is not at present represented in the membership of the state's Centennials Commission.

"We recommend the addition of an industry representative to aid in the accumulation of appropriate factual and historical data and exhibits relating to the industry," Austin said.

A copy of the resolution adopted by the Chamber is being forwarded to the Congressional Representatives from California in Washington in support of the necessary authorization for a gold souvenir commemorating the Centennial.

WORLD NEWS ON MINERAL OCCURRENCES

(Bureau of Mines **Mineral Trade Notes**, September, 1947)

I. METALS

BAUXITE

GREECE.—The two most important bauxite areas in Greece are on the slopes of Mount Parnassus, near Delphi, on the Gulf of Corinth, and involve the prewar concessions of the Bauxite Co. of Parnassus (prewar production 250,000 metric tons) and the Delphi Bauxite Mines (30,000 tons). Considerable damage was done during the war to the Topolia, Kaniani, and Variani mines of the Bauxite Co. of Parnassus. The company was sold to the Germans. Efforts are being made to lease the mine to previous owners pending decision of the Court. Possible reserves are estimated as 8,000,000 tons.

War damage at the Amphissa mine of the Delphi Bauxite Mines was slight. The mine is not operating. Possible reserves are estimated at 5,000,000 tons.

The Iandra and Iegala Pefha mines owned by D. Scalistiris are working on a reduced scale. Possible reserves are estimated at 2 to 3 million tons.

A bauxite mine at Krenes, Chalcidice Prefecture, is said to contain large quantities of ore. The mine has never been operated.

The Eleusis mine, owned by Dimitri Scalistiris of Athens, is expected to produce between 15,000 and 25,000 tons of bauxite in 1947. Stocks at the mine on June 30, 1947, were 12,837 tons. Production during the first half of 1947 was 11,580 tons. The price of bauxite is 75/-per ton f.o.b. Greek ports.

Another exploration of importance is the Berlos Brothers Bauxite Co. of Distomo. on the slopes of Mount Parnassus, near Distomo.

(Second Secretary and Consul William Witman II, Athens. Vice Consul George A. Hays, Salonika; and Clerk Alfred E. Dominos, Athens.)

CHROMITE

CYPRUS.—Operations of the Cyprus Chrome Co., Ltd., were directed chiefly to development during 1946. The concentrating plant was idle throughout the year but was expected to resume operations in 1947. An adequate supply of labor remains one of the chief problems of the company owing to its remote situation.

(From reports submitted by Vice Consul Philip Ernst and Annual reports of the Inspector of Mines for 1945 and 1946.-

GREECE.—Status of the chrome mines in Macedonia and Thrace is reported by the Inspector of Mines, Ministry of National Economy, and local mining men, as follows:

NATIONAL MINES owns a group of mines at Sedhes, Salonika. The mine is inactive, and installations have been either destroyed or are worn out. Prospects for profitable mining are not promising.

P. Tsasoussis owned a mine at Katerini, Salonika, which is now inactive. A small output has been obtained from the mine, but the quantity is not known.

Nic. Zenetos owns the Elaphina mine at Elafina and Vergina villages, Salonika. The mine is inactive but has produced 15,000 tons of high-grade ore. All equipment has been lost, and prospects for profitable mining are very poor.

National Mines has leased to Panag. Vryonis a group of mines at Vavdos, Chalcidice. These mines have produced over 25,000 tons, or better than 40 percent ore and over 15,000 tons of ore under 40 percent. Future output has been estimated at 2,500 of high-grade ore and 6,000 tons of lower-grade ore. The mines have been inactive since 1944. Installations are in good condition, but prospects for profitable mining are poor.

The mine at Ormilia, Chalcidice, owned by Angelakis, has produced 60,000 tons of ore. Future output is estimated at 500 tons of over 40 percent and 2,000 tons of under 35 percent ore. The mine is inactive and all equipment has been destroyed. Prospects for profitable mining are said to be fair.

The Karkara mine at Ormilia, Chalcidice, owned by N. Zacharakis, has produced 5,000 tons of ore. Prospects for future mining is very poor.

The mine at Gomation, Chalcidice,

owned by Kakoulides Vatikiotis, has produced 10,000 tons of ore. Future output has been estimated at 2,000 tons of low-grade ore. The mine is inactive, and prospects for profitable mining are poor.

Galarinos mines, a group of four mines in triangle formed by villages of Triodion Thermi-Vassika Galarinos and owned by Dikaiophylax, has produced over 10,000 tons of over 40 percent and over 5,000 tons of under 40 percent ore. The mines are inactive, and installations have been destroyed. Prospects for profitable mining are poor.

The mine owned by Andreas Antoniou at Ormilia, Chalcidice, is inactive.

Sotirios Papassotiriou owns the Burinos mine, St. Afiltse, Kozani, which has produced 70,000 tons of over 40 percent ore. Positive future output has been estimated at 12,000 tons, which could possibly be increased to 24,000 tons. The mine is inactive, and equipment has been destroyed. Prospects for profitable mining are fair.

Other mines in Kozani Prefecture are at Rodiani, Zafordas Monastery, Exarchos, and Tranovaltos.

The mine owned by Zissis Papadopoulos at Soufli, Evros, is inactive.

The Tsangli mine, 20 miles west of Volvos, is operating on a small scale. Damage by guerrillas is heavy and some 9,000 tons of stocks were seized. Production during the first half of 1947 totaled 3,000 tons. Stocks on hand June 30, 1947, were 3,000 tons.

The Domokos mine, 13 miles north of Lamia and owned by the Societe Union Miniere (Bank of Athens),was recently closed owing to exhaustion of ore. Normal prewar output was 20,000 tons.

The chromite deposit on Rhodes Island, near Appolon, is inactive.

(Second Secretary and Consul William Witman II, Athens; Vice Consul George A. Hays, Salonika; and Clerk Alfred E. Dominos, Athens.-

PHILIPPINE REPUBLIC.—The Consolidated Mines property at Masinloc produced 58,000 tons of chromite in 1946. In the first quarter of 1947, 40,000 tons of ore, including 38,000 tons to the United States, were exported.

(Assistant Commercial Attache Patten D. Allen, Manila.)

GOLD

PHILIPPINE REPUBLIC.—The first gold exported from the Philippines since 1941 was shipped in April by the Atok Gold Mining Co. to the United Kingdom. Atok's Big Wedge property is the first to get into large-scale production.

The Benguet Consolidated Mining Co. has spent over $2,000,000 and is to spend another million constructing a completely new mill, which will serve the Benguet, Cal Horr, and Balatoc properties. Capacity of the mill will be 4,000 tons daily. The company's three prewar mills were almost completely destroyed by the Japanese.

On July 26 the Government agreed that gold should not be exported at premium prices, corresponding to action taken by the United States and the United Kingdom in support of the Monetary Fund.

(Assistant Commercial Attache Patten D. Allen, Manila.)

IRON ORE

GREECE.—The principal deposits of iron ore are found on the Island of Seriphos and are owned by the Seriphos Spiliazeza French Co. Light damage and loss of equipment and stores were incurred during the war. Normal prewar production was 110,000 metric tons. The mines are working on a reduced scale. Approximately 150,000 tons of ore have been shipped from the large stocks on hand. Possible reserves are estimated at 1,500,-000 tons.

Iron ore is found on Cos Island, also.

LEAD AND ZINC

GERMANY.—Permission to resume operations has been granted the Eiffel Lead Mines at Mechernich. The Childergrasse mines near Wenden, British Zone, are preparing for the exploitation of lead and zinc deposits in the southern part of Westphalia.

GREECE.—The Laurium mines, 25 miles southeast of Athens, produced 300 metric tons of lead concentrates, 700 tons of zinc concentrates, and 500 tons of lead metal during the first half of 1947.

An American company has obtained a 50-year concession for the research and exploitation of lead-zinc properties at Kirka, Thrace. During the war, the Kirka mine was operated by the German Army but since liberation it has been inactive.

The Greek Chemical & Fertilizer Co. has obtained a 50-year concession for the research and exploitation of lead ore in the area of Vina, Chalcidice.

Nic. Zenetos Sterg. Zourbas has leased his mine at Axioupolis, Salonika, to the Macedonia Mineral Co. To date the mine has produced 150 tons of high-grade ore. It is estimated that the mine can produce 50 tons of lead ore and possibly 150 tons. The mine is inactive, but prospects for profitable mining are reported to be very promising.

(Second Secretary and Consul William Witman II, Athens; Vice Consul George A. Hays, Salonika; and Clerk Alfred E. Dominos, Athens.)

MANGANESE

GREECE.—The minganese mines at Zirnovos, Ano and Kato Kalopoti, Drama, are inactive. About 700 metric tons of ore are on hand at the mines. The mines were worked up to the outbreak of the war and the ore shipped chiefly to Great Britain.

(Second Secretary and Consul William Witman II, Athens, and Vice Consul George A. Hays, Salonika.)

MERCURY

URUGUAY.—A deposit of mercury is reported to have been discovered in the village of Vergara, Department of Treinta y Tres. Instituto de Geologia y Perforaciones is preparing to conduct tests of the deposit.

(Commercial Attache Franklin W. Wolf, Montevideo.)

MOLYBDENUM

GREECE.—The Mavrodendra mine, 50 miles northwest of Salonika, is in State custody. The mine is not working but is well-equipped.

(Second Secretary and Consul William Witman II, Athens.)

NICKEL

GREECE.—The nickel mine at Larimna (Kokino), 14 miles north-northwest of Thebes, was extensively damaged during the war. The mine is not working, as there is no market for this low-grade ore. Possible reserves are estimated at 1,300,000 tons. Normal output before the war was 50,000 tons annually.

(Second Secretary and Consul William Witman II, Athens.)

TITANIUM

MEXICO.—A promising deposit of ilmenite is reported near Ciudad Victoria, State of Tamaulipas. The contact vein is believed to be about 30 feet thick, 2,500 feet deep, and 2 miles long and to contain 50 million tons of ore averaging 40 to 45 percent TiO_2.

TUNGSTEN

AUSTRALIA (TASMANIA).—According to the King Island Scheelite Co., the only scheelite producer in Tasmania, at least 800 long tons of concentrates should be produced in 1947.

Production of wolframite totaled 57,058 tons in the first quarter of the year. Wolframite is produced almost entirely by two companies—the Storeys Creek Tin Mining Co. and the Aberfoyle Tin Mining Co.—as a by-product of tin mining.

(Vice Consul Armistead M. Lee, Melbourne.)

II. INDUSTRIAL MINERALS

ABRASIVES - CORUNDUM AND INDUSTRIAL GARNETS

MADAGASCAR.—In the first quarter of 1947, the France-Belgium-Luxemburg Commission authorized the shipment of 50 tons of corundum and a million French francs worth of industrial garnets, export licenses being valid to July 31, 1947. The Service of Mines reported that no corundum was being mined currently. Industrial garnets are produced in the extreme southwest section of Madagascar with exit by the port of Tulear, whence shipping facilities are relatively scarce. There is only one producer of industrial garnets.

(Commercial Clerk Jean-Jacques Lebrun, Tananarive.)

ASBESTOS

CYPRUS.—The Tunnel Asbestos Cement Co. is the sole producer of asbestos in this country. In 1945 and 1946 the Amiandos asbestos mine operated throughout the working season (dry season) on an increased scale, but, owing to the labor shortage that has been experienced the past few years, the output of asbestos fiber

did not reach the required level. Although there was some increase in the number of workers seeking employment in 1946, the mine remained short of labor.

No difficulty was experienced in 1945 or 1946 in selling the longer grades of fiber produced, for which a steady demand is expected, but the opportunities of disposing of the short-grade fiber were less favorable.

(Annual reports of the Cypriot Inspector of Mines, 1945 and 1946.)

BARITE

GREECE.—Barite output in 1938 and 1939 was 34,700 and 24,055 metric tons. No later production figures are available.

Early in 1947, the Milos barite mine on the Island of Milos was working on a small scale, having shipped more than 3,000 metric tons. The normal annual prewar production was 34,000 tons, including crude material. The possible reserves are stated to be 3,000,000 tons. War damage and lack of maintenance resulted in the loss of machinery and damage to jetty. The mine is owned by the Silver & Barytes Mining Co.

(Second Secretary and Consul William Witman II, Athens.)

EMERY

GREECE.— The Naxos mine, a State mine on the Island of Naxos, suffered war damage to equipment and jetty. Early in 1947, it was reported that the mine was not working because repairs had not been completed. If the necessary cash were available, it was hoped to commence work at the end of April and to export 20,000 tons of emery before the end of 1947. Stocks have been shipped. The normal annual prewar production of emery by this company was 10,000 metric tons.

(Second Secretary and Consul William Witman II, Athens.)

It is very unfortunate for Greece, reports Clerk Alfred E. Dominos, Athens, that this product of the country is being supplanted by the use of artificial abrasives on the world market. As a result, production and marketing of emery ore is lagging, although the country possesses very rich deposits of this natural abrasive.

Output of emery, all from Naxos Island totaled 5,000 metric tons in the first half of 1947. Stocks on hand June 30 were 8,500 tons. Emery prices are always quoted in drachmas for delivery from the Government warehouses in Syra. The range of prices varies according to the quality as follows:

Quality	Drachmas per ton
First quality:	
Big pieces	240,000
Small pieces	220,000
Second quality:	
Big pieces	180,000
Small pieces	170,000

GRAPHITE

MADAGASCAR.—The situation in the graphite industry has been unsettled for almost a year for various reasons. This is reflected in production. In 1946 (according to figures received recently in the Bureau of Mines), the output was 4,426.140 metric tons of flake graphite, and 1,888.408 tons of powdered graphite.

In the last few months of 1946, Etablissements Gallois, one of the principal producers, produced nothing owing to a landslide that disorganized their chief mine, from which the bulk of their output came. It was expected that when Gallois renewed mining, 50 tons more monthly would be obtained. The company started equipping new graphite mines in the Tampina area of Tamatave Province. There was such a shortage of labor that producers stated that until they received mechanical equipment no increase in production could be considered.

Madagascar and Ceylon are two of the world's main producers of graphite. The former has the advantage that the deposits as yet do not have to be mined underground. Many of Madagascar's deposits have not been worked, and others have been abandoned until better prices are paid for the product.

Next after coffee production, graphite was the worst hit by the insurrection that began at the end of March 1947. The best deposits are not far from the railroad between Tamatave and Moramanga. But other mines are hundreds of miles southwest of that section, near Ambositra

and east of Antsirabe; these last-named areas are in the district overrun by rebels.

Relatively little damage could be done to the mines themselves, which have little or no machinery, beyond destroying huts, storehouses, and bags, whether empty or filled. The crippling damage would be to the plants and transportation. The plants, usually near a group of mines, have flotation equipment and machines for separation and picking. The value of the plants ranges from $7,000 to $50,-000. For months no graphite could be transported from the largest plant (belonging to Gallois), even though damaged.

Augustin Gallois mines near Tamatave could produce about 2,500 tons of flake and 800 tons of powder a year. His son, Roger Gallois, early in 1947, was reopening a mine near Ambatolampy, on the plateau, which may become important.

The extent of the damage was not yet known. In certain workings, houses of laborers and personnel and offices were destroyed, but the plants seemed intact. From a plane (the only way observations could be made) nothing could be seen except the roofs, and there was a complete lack of knowledge regarding destruction under the roofs.

According to information from the Director of the Madagascar Service of Mines at the beginning of the second half of 1947, no accurate figures of stocks could be obtained, some of the zones being still in danger from rebels. He estimated that there were at least 1,500 metric tons of powder and flake graphite at the mines waiting to be moved to the railroad. The port of Tamatave was depleted of stocks.

At present (September 1947) only one mine owner (Gallois), whose mines have not been damaged at all from the rebellion, is actually producing graphite. The Director of Mines states that the owner can produce 200 tons monthly from his mines in the Brickaville region and 100 from those in the Ambatolampy district. The Société Generale des Graphites is re-equipping one of its mines, which was closed years ago. It may soon produce 50 tons a month.

(The foregoing was compiled from various reports prepared by Consul General Robert F. Fernald and Commercial Clerk Jean-Jacques Lebrun, Tananarive.)

GYPSUM

CYPRUS.—In 1945, producers of gypsum in Cyprus were interested in developing their export market, although it was realized that the high cost of production and heavy freight rates for this low-priced mineral were handicaps. George Economides, the main producer, who works gypsum deposits at Boghaz, proposed to install a modern calcining kiln to produce plaster of Paris and certain mechanical equipment so as to reduce working costs. The annual report of the Inspector of Mines for 1946 does not mention whether the mechanization materialized. The report states: "The close proximity of the deposits to the port of exports, low working costs, efficient loading facilities and cheap freight rates are essential factors for large-scale exploitation in Cyprus of this comparatively low-priced and widely distributed mineral. The absence of the combination of these factors has up to the present restricted gypsum exploitation, but the position was being reviewed by a number of companies at the close of the year."

MAGNESITE

GREECE.—According to a report from Second Secretary and Consul William Witman II, at Athens, early in 1947, the status of some of the magnesite mines in Greece was as follows:

YERAKINI MINE

Location of mine: Yerakini, 40 miles southeast of Salonika.

Owner: Anglo-Greek Magnesite Co.

Damage due to war plus lack of maintenance: Loss of lighters, tools, and equipment.

Normal annual prewar production: 27,000 metric tons raw material.

Present situation: Not working owing to unrest in area.

Possible reserves: 300,000 tons.

KATOUNIA MINE

Location: Three miles southeast of Limni, on Island of Euboia.

Owner: Anglo-Greek Magnesite Co

Damage due to war plus lack of

maintenance: Equipment damaged.

Normal prewar annual production: 38,-000 tons raw material.

Present situation: Working on a small scale and shipping stock.

Possible reserves: 200,000 tons.

MANTUDI & YEROREVNA MINE

Location: Euboia.

Owner: Société Financiere de Grece.

Damage due to war plus lack of maintenance: Loss of stores and equipment.

Normal annual prewar production: 22,-000 tons raw material.

Present situation: Not working. Selling reserves to Lambrinides who is calcining and shipping.

Possible reserves: 150,000 tons.

VAVDOS MINE

Location: 23 miles southeast of Salonika.

Owner: P. D. Vryenis.

Damage due to war plus lack of maintenance: Loss of stores and equipment.

Normal annual prewar production: 15,000 tons raw material.

Present situation: Working but mining has been delayed. Shipping 1,500 tons.

Possible reserves: 100,000 tons.

TROUPI & DAFNOPOTEMOS MINE

Location: Euboia.

Owner: J. G. Lambrinides.

Damage due to war and lack of maintenance: Loss of stores and equipment.

Normal annual prewar production 22,000 tons raw material..

Present situation: Working on small scale. Calcining and shipping from stock.

Possible reserves: 100,000 tons.

PSILIRAKI MINE

Location: Euboia.

Owner: D. Skalisteris.

Damage due to war and lack of maintenance: Destruction of jetty and loss of stores.

Normal annual prewar production: 10,-000 raw material.

Present situation: Working and shipping caustic on small scale.

Possible reserves: 40,000 tons.

MITYLENE MINE

Location: Island of Mitylene.

Owner: A. P. Apostolides.

Damage due to war and lack of maintenance: Small damage and loss of stores.

Normal prewar annual production: 10,-000 tons raw material.

Present situation: Not working. Owner concentrating on chrome.

Possible reserves: 50,000 tons.

According to a current report from Consul General George A. Hays, Salonika, information on the magnesia mines in Macedonia and Thrace is as follows:

Location: Salonika Prefecture, Sehdes.

Owner: National Mines, Grand-Mahale.

Present status: Inactive.

Location: Chalcidice Prefecture, Galatsista, Galarinos; a group of 4 mines in a triangle formed by the villages of Triodion, Thermi, Vassika, and Galarinos.

Owner: Vas. Dikaioplylas, 20 Ermon Street, Salonika.

Ore mined to date: More than 20,000 metric tons.

Positive future output: 3,000 tons.

Present status: Inactive. Installations destroyed. Much equipment is required. Prospects of profitable mining very promising.

Location: Chalcidice Prefecture, Aghia Paraskivi, Galatsista, (group of mines).

Owner: French Mineral Corp. PREMIN, Agent, Gavrielides Tsimiski-Komninon Sts., Salonika.

Ore mined to date: More than 20,000 metric tons.

Positive future output: 5,000 magnesite, and 2,000 tons caustic magnesite.

Present status: Inactive. Plant and installations destroyed. Little research and mining equipment required. Prospects of profitable mining are very promising.

Location: Chalcidice Prefecture, Vavdos group of mines.

Owner: Panag Vrionis. Agent: Stavros Tsaronftis, Megaron Missirloglou.

Ore mined to date: More than 50,-000 tons magnesite; more than 50,000 tons caustic magnesite.

Positive future output: Present annual production is over 15,000 tons magnesite, over 6,000 tons caustic magnesite.

Present status: Mining magnesite since 1946. Mining equipment is available in good condition. Very little research and mining equipment are required. Deposits exploited.

Location: Chalcidice Prefecture, Polygyros section.

Owner: National Mine, Polygyros.

Present status: Inactive.

Location: Chalcidice Prefecture, Karkaras.

Owner: French Project & Exploitation Co.

Present status: Inactive; no mining since 1932. Prospects of profitable mining are problematic.

Location: Chalcidice Prefecture, Gerakini Polygyros.

Owner: Greek-Hellenic Co., 2 Kornaron St., Athens.

Ore mined to date: More than 50,000 metric tons magnesite; more than 50,000 tons magnesia.

Positive future output: 30,000 magnesite; over 10,000 magnesia.

Present status: Inactive. Available installations are in good condition. Very little research and mining equipment required. Prospects of profitable mining are favorable.

Location: Chalcidice Prefecture, Akonorakis.

Owner: National Mines.

Ore mined to date: 20,000 metric tons.

Possible future output: 10,000 tons magnesite; over 3,000 tons magnesia.

Present status: Inactive. Available installations in good condition. Little equipment required. Prospects of profitable mining are favorable.

Location: Chalcidice Prefecture, Trikorfon Mine, Konkos.

Owner: Const-Kakonlides.

Lessee: N. Zackarakis, 24 Kolokotroni St., Salonika.

Output to date: 20,000 metric tons magnesite; 3,000 tons magnesia.

Positive future output: 7,000 tons magnesite; 2,500 tons magnesia.

Present status: Inactive. Installation destroyed. Little equipment required. Prospects for profitable mining favorable.

Location: Chalcidice Prefecture, Karkara Mine.

Owner: N. Zacharakis.

Ore mined to date: More than 6,000 metric tons.

Positive future output: More than 3,000 tons magnesite; 1,000 tons magnesia.

Present status: Inactive. Installations destroyed. Much equipment required. Prospects for profitable mining are favorable.

Location: Chalcidice Prefecture. Ormilia Mine.

Owner: Andreas Antonion.

Output to date: More than 10,000 metric tons of magnesite; 2,000 tons magnesia.

Positive future output: More than 5,000 tons magnesite; 2,000 tons magnesia.

Present status: Inactive. Much equipment required. Prospects for profitable mining are favorable.

In the 10-year period from 1929 to 1938, 846,594 tons of magnesite were produced. In 1938 production reached 168,000 tons. A study of world statistics shows that Greece normally mined 15 percent of the world production of magnesite. Output in the first half of 1947 totaled about 2,500 metric tons, chiefly fom the Vavdos mine. Stocks on hand June 30 were 3,000 metric tons.

MICA

MADAGASCAR.—In 1946, production of muscovite mica totaled 1,730 kilograms valued at 622,809 francs and 466,141 kilograms of phlogopite mica valued at 44,329,251.65 francs, compared with 7,891 kilograms of muscovite valued at 679,414 francs and 611,788 kilograms of phlogopite mica valued at 40,393,277 francs in 1945.

The mica region is not in the rebel territory. The producing area is in the extreme south of Madagascar, south of latitude 26. Except for one mine, which has shafts and galleries, all of the mines are open-cut or strip. A mica producer who arrived in Tananarive about mid-

June, en route to Europe and the United States, estimated the monthly production at 32 to 46 tons.

(Commercial Clerk Jean-Jacques Lebrun, Tananarive.)

MINERAL PIGMENTS

CYPRUS.—Of the mineral pigments produced in this country, umber leads the list as to quantity. The improved outlook for umber that developed in 1944 continued in 1945 and 1946, and control over the importation into the United Kingdom was removed. The demand for this earth pigment came chiefly from the United Kingdom and the United States. The principal exporter was the Umber Corporation of Larnaca, Ltd.

PYRITES

GREECE.—According to Second Secretary and Consul William Witman II, at Athens, early in 1947, the status of some of the pyrites operations in Greece was as follows:

KASSANDRA MINE

Location: 45 miles east of Salonika.

Owner: Chemical Products & Fertilizer Co.

Damage due to war plus lack of maintenance: Damage not heavy.

Normal annual prewar output: 200,000 tons.

Present situation: Largest mine in Greece. Working now on reduced scale of 2,500 tons per month owing to unrest in the area. Equipment quite modern, but development has not been as satisfactory as it might have been.

Possible reserves: 1,500,000 tons.

HERMIONE MINE

Location: 28 miles southeast of Navplion.

Owner: Chemical Products & Fertilizer Co.

Damage from war: None.

Normal annual prewar output: 27,000 tons.

Present situation: Working at approximately 700 tons per month for local consumption. Large installation.

Possible reserves: Reserves rapidly becoming exhausted.

Consul General George A. Hays, at Salonika, reports (in the current month of August 1947) the following for Macedonia and Thrace.

Location: Chalcidice Prefecture, Kassandra.

Owner: Ellenike Eteria, Hamikon Proin-Tonkai Lipesmaton.

Ore mined to date: Not known.

Possible future output: 100,000 metric tons per annum.

Present status: Inactive.

Mining equipment required: Drilling machinery has been purchased recently.

Location: Kavalla Prefecture, Arvanotohorion.

Owner: Ioannis Economides, Kavalla, "Chemical Products Co."

Ore mined to date: Over 8,000,000 metric tons of iron pyrites.

Positive future output: 100,000 tons per annum.

Present status: Inactive.

Installations on hand: Available equipment in good condition.

Research and mining equipment rerequired: Very little.

According to Consular Clerk Alfred E. Dominos, Athens, output of iron pyrites in the 10-year period 1929-38 was about 4,000,000 tons.

Although research on three of the Islands of the Dodecanese has revealed the existence of chrome ore, iron ore, and sulfur, only the sulfur deposits are being operated at present. The sulfur mines of the Island of Nisyros are producing 1,000 to 3,000 tons of ore annually, having an average sulfur content of 35 percent.

PYRITES AND SULFUR

CYPRUS.—The following details on pyrites and sulfur in Cyprus have been abstracted from a report submitted by Vice Consul Philip Ernst, Port Said, Egypt, and the Annual Reports of the Inspector of Mines for 1945 and 1946.

Pyrite is the mineral of greatest importance to the Island of Cyprus. Exports of pyrites are second only to those of the agricultural product carobs. Upon termination of hostilities in Europe, the chief pyrites producers on Cyprus obtained good-sized contracts from the Continent, principally France, Belgium, and Switzerland, for pyrites to be used in the manufacture of sulfuric acid for superphos-

phate. As most of the mines in Cyprus resumed full operation in 1946, the value of mineral exports more than doubled that of 1945.

It was estimated that a larger quantity would be exported in 1947. Output of pyrites reached its peak in 1938 when about 500,000 tons were exported.

Three companies, which will be described separately, produce the pyrites on Cyprus.

Cyprus Mines Corporation

With the improved outlook for pyrites in 1945, and having obtained an important French contract, the company, in the last half of the year, prepared the Mavrovouni mine and the treatment plant at Xeros for resumption of operations. Of the 84,340 tons (dry long tons) of pyrites shipped from stock, 80,390 tons went to France, and the remainder, 3,950 tons, went to Egypt. It is worthy of note that the estimated cost of supplies, which before the war was 52 percent of the Corporation's total costs, increased an average of 185 percent.

During the shut-down period (since 1940) the mine remained in remarkably good condition, and when the necessary supplies were received stoping operations were resumed in May 1946. This copper-pyrites mine was operated on a single 8-hour shift until September 1946, when a second shift was introduced. The shortage of skilled and semiskilled underground labor restricted production, but 183,432 tons of ore was mined and railed to the Xeros treatment plant. Very small footage of development was achieved owing to the labor shortage.

A part of the concentrating plant at Xeros, with a total capacity of 60,000 tons per month, came into operation in May 1946 and during 7½ months treated 179,826 tons of ore and produced 24,,727 tons of copper concentrates and 103,132 tons of flotation pyrites. Pyrites totaling 166,750 tons were shipped from stocks and current production, of which 156,908 tons went to France.

The ore at Mavrovouni mine analyzes 3.5 to 4 percent copper and 45 to 47 percent sulfur. The ore is mined by top slicing.

The three other mines of Cyprus Mines Corp.—Skouriotissa, Apliki, and Mathiati—were closed throughout 1945 and 1946. Formerly the Skouriotissa mine was mined by cut and fill stoping and top slicing. It is in a pyrite (with some chalcopyrite), flat-lying, replacement lens in andesite pillow lavas immediately below contact with marls and limestones. Analysis of the pyrite ore was 2 to 2.5 percent copper, 46 to 48 percent sulfur, and about 0.25 oz. gold per ton. The output from the Apliki mine resulted from development activities. It is in a deposit of pyrite, with some chalcopyrite, replacement body in andesite extrusive. Analysis of the pyrite ore was 1.5 percent copper, 49 percent sulfur, and about 0.50 oz. gold per ton. The Mathiati mine was worked by the opencast method.

Hellenic Co. of Chemical & Manures Ltd.

Operations at this company's pyrite mine at Kalavasso continued without interruption throughout 1946 although during some periods development and stoping progress was hindered by the manpower shortage, which was felt throughout the mining industry. Pyrites totaling 105,951 tons were mined and railed to the crushing and washing plants at Vassiliko. Of the 107,457 tons of ore crushed, 39,226 tons of impure pyrites passed through the washing plant.

The development work done in 1946 totaled 4,345 feet, made up of 81 feet of shaft sinking, 249 feet of rising and winzing, and 4,015 feet of driving and cross cutting. The Kalavassos property was churn-drilled 1,614 feet, and 1,589 feet were drilled in the Ambelikou prospecting area. Two geophysicists from South Africa were engaged for 4 months on prospecting in the Kalavassos and Ambelikou areas, and drill holes will be put down in promising zones.

As a part of a general housing scheme, additional workmen's accommodations were provided during 1946 at the Kalavassos mine and at the Vassiliko treatment plant.

Cyprus Sulphur & Copper Co., Ltd.

In 1945, the aerial ropeway from the Limni mine to the concentrating plant situated near the coast was completed, and

production on a reduced scale was begun in September. Disseminated pyrites totaling 7,300 tons were mined and treated in the concentrating plant for an output of 2,800 tons of pyrite concentrates, but, owing to lack of suitable pumping arrangements, the quantity of water delivered was inadequate for the plant to work at full capacity, and operations were suspended at the end of November 1945.

The Limni mine (which was leased to the Cyprus Sulfur & Copper Co., Ltd.) remained closed throughout 1946. The property was examined by a consulting engineer on behalf of the National Mining Corp. of London. Following the engineer's report, it was understood that the Cyprus company was to be reorganized and that active operations would begin at the mine as soon as practicable. It was expected that a drilling campaign would commence early in 1947.

III. MISCELLANEOUS INFORMATION GREECE AND DODECANESE ISLANDS

GENERAL.—The mining and mineral industry of Greece, which lost a great deal during the occupation in World War II through plunder and destruction of installations and equipment, has been unable so far to make any substantial progress toward recovery. Guerrila fighting current in many parts of Greece, lack of adequate capital to finance restoration of destroyed installations, and high production costs have been the greatest obstacles to a revival of activity. Seventeen mines are now (September 1947) operating, of a prewar total of 76. Production of ores in 1947 is not expected to exceed 122,000 tons, compared with more than a million tons in 1938. Two American companies have been formed since liberation for the research and development of lead metal and zinc concentrates and lignite.

There is no major mining exploitation in the Dodecanese Islands, production being confined to about 1,500 tons of sulfur mined annually at Nisyros. Bauxite and magnesite are among the principal minerals of Greece. A million tons of each could easily be obtained annually provided world market conditions warranted such an increase.

In the 17 mines that have resumed activity, operations at present are on a greatly reduced scale. These mines include the lignite mines near Athens, those on the Island of Euboea, in Attica, Thrace, and Eastern and Western Macedonia. Such mines as iron, magnesite, and lead, and others are active presently in Attica, Volos in Thessaly, Kassandra, and Vavdos in the Chalcidice area near Salonika, and on the islands of Naxos, Ermioni, and Milos.

Destruction of installations and the lack of liquid assets would not constitute insurmountable obstacles to recovery at a time when the necessity for economic rehabilitation of Greece makes it imperative for the country to develop all its natural resources and especially those that are sure of foreign exchange, had this situation not been aggravated by the heavy guerrila fighting and the political unrest current in many parts of Greece, which frustrate and nullify any attempt at resumption of activity.

Another serious problem that confronts Greek mining enterprises and paralyzes any incentive is the doubtful business outlook caused by the inability of Greek production to compete at present with the world market quotations from countries whose economy has not been shattered by the war and which are, therefore, in a position to quote export prices far below the high level of Greek production costs.

The following mines are reported to be operating in 1947:

Location of mine and Ore produced

Kassandra (Chalcidice)—
Iron pyrites.

Vavdos (Chalcidice)—
Magnesite (crude and calcined).

Tsangli (Larissal)—
Chromite.

Laurium (Attica)—
Lead metal and zinc concentrates.

Island of Milos—
Barite.

Eleusis (Attica)—
Bauxite.

I land of Naxos—
Emery ore.

Island of Ermioni—
Iron pyrites and copper pyrite.

(Continued on page 138)

The Rocks and Minerals Association

(Members All Over the World)

President, Oscar W. Bodelsen
219 E. Main St.
Mt. Kisco, N. Y.

Vice-President, Ronald L. Ives
Univ. of Indiana, Bloomington, Ind.

Director of Tours, Richmond E. Myers
Dept. of Geology,
Muhlenberg College, Allentown, Penn.

Secretary-Treasurer, Peter Zodac
Box 29, Peekskill, N. Y.

Organized in 1928 for the increase and dissemination of mineralogic knowledge

To stimulate public interest in geology and mineralogy and to endeavor to have courses in these subjects introduced in the curricula of the public school systems; to revive a general interest in minerals and mineral collecting; to instruct beginners as to how a collection can be made and cared for; to keep an accurate and permanent record of all mineral localities and minerals found there and to print same for distribution; to encourage the search for new minerals that have not yet been discovered; and to endeavor to secure the practical conservation of mineral localities and unusual rock formations.

Ever since its foundation in 1928, the Rocks and Minerals Association has done much to promote the interest in mineralogy. It has sponsored outings, expeditions, formations of mineralogical clubs and the printing of many articles that have been a distinct contribution to mineralogy.

Those of our readers who are members of the Association can rightly feel that they too were sponsors of these many achievements that have helped to give mineralogy a national recognition. Among your friends there must be many who would like to have a part in the Association's work—to share with you the personal satisfaction, the pleasure, and the benefits of membership. Will you give your friends this opportunity to join the Association by nominating them for membership?

Each new member helps to extend the Association's activities—helps to make your magazine larger, better, and more interesting, and above all assists in the dissemination of mineralogical knowledge.

Some advantages of membership: All members in good standing receive:

(1) **Rocks and Minerals**, a monthly magazine. (2) A member's identification card that secures the privileges of many mines, quarries, clubs, societies, museums, libraries. (3) The right to participate in outings and meetings arranged by the Association. (4) The right to display a certificate of membership and to place after their names a designation indicating their membership or to advertise membership on stationery, etc. (5) The distinction and the endorsement which comes from membership in the world's largest mineralogical society.

Mineralogical clubs which subscribe for **Rocks and Minerals** also become affiliated members of the Rocks and Minerals Association and enjoy all the advantages which such an affiliation affords.

A number of clubs hold membership in the Association, participate in the annual outings, and co-operate in many ways in furthering the aims and ambitions of the Association.

Affiliation with the world's largest mineralogical society cannot fail to increase membership, enlarge circles of acquaintanceship, and stimulate a keener interest in mineralogy.

CLUB AND SOCIETY NOTES

ATTENTION SECRETARIES—If you want your reports to appear in the April issue, they must reach us by March 20th—the Editor.

Chattanooga Rocks & Minerals Club

The Club met January 22nd, 1948, at the University of Chattanooga. Plans were discussed for the collection of rocks and minerals of the territory contiguous to Chattanooga that have industrial uses. The list includes hematite, galena, coals, tripoli sands, gravel, sandstone, limestone, dolomite, bauxite, chert, bentonite, and many others such as steatite, ochre, manganese, and barite.

Mr. Otto Gutenson reported a new find of tripoli. The discussion then turned to fossils and by their aid to identify formations.

Mr. Frank Bates of the American Lava Company was taken in as a new member.

Geo. C. Olmsted
Pub. Com.
Signal Mountain, Tenn.

The Chicago Rocks and Minerals Society

On Saturday December 13th, 1947, the Chicago Rocks and Minerals Society held their last meeting of the old year at the Green Briar Field House. A large number turned out to hear Emil Kronquist of the Milwaukee Vocational School. Mr. Kronquist gave us a most interesting talk on laboratory methods of silver working. He emphasized that the basis of good work is;

1. Good design.
2. Practise, and practise,and plenty of it.
3. Patience and care.

His lecture was so interesting that we wished that it did not come to an end even though there was cake and coffee waiting for us. I am sure that many of us have gone out and purchased his books after listening to such an interesting and wonderful lecture.

On Saturday January 10th, 1948, the Chicago Rocks and Minerals Society held their regular monthly meeting at the Green Briar Field House. The speaker of the evening was Mrs. Theron Wasson, geologist and lecturer of the Pure Oil Company. Her subject was the geology of the Chicago Area. All rockhounds in this area believe that there is very little interest around here. However, we learned from Mrs. Wasson that this area is a most interesting place for geological study and for its specimens of fossils in limestone. Mrs. Wasson gave us such an interesting talk that more than one member was heard to say, "And I thought that the geology of the Chicago area was a dull study!"

We are glad to share these interesting lectures with all visitors who wish to come.

Ralph Beach

Queens Mineral Society
(Richmond Hill, N. Y.)

The first meeting of the new year was held on Thursday, January 8th. Mr. W. Helbig was the featured speaker for the evening, and his subject was the work of the late Prof. V. Goldschmidt in his conclusions of the principles of distribution of the chemical elements in minerals and rocks. We were introduced to the important part that the wanderers of outer space, namely meteors, had played in the conclusions reached by Prof. Goldschmidt in his exhaustive investigation of the relationship of their composition to that of the construction of the earth we live on. We were informed, in complete detail, of the three types of meteors namely Rock Meteors, Sulphide Meteors, Iron-nickel Meteors. Comparison of the affinity of meteoric iron for the rare elements, with that of the concentrations of iron found in Iceland, bare out the findings of Prof. Goldschmidt. We were informed of the fact that radio-active minerals release Helium in the Alpha rays. Pig iron and silicate slags in copper and iron foundries, were used to illustrate a partition of elements into geo-chemical groups. It was pointed out that if the nucleus of our earth is as rich in gold as the average iron meteorite (about 5 grains per ton) then the interior of our earth would probably contain enough gold to cover the earth with a coat of gold three feet thick. The manner in which ions enter into a crystal lattice and the weakening or strengthening of the bond due to size of ions was described. A summary of all Prof. Goldschmidt's investigations on crystallized minerals of magmatic origin, was made to indicate that we may state that the radii and valency properties of the atoms and ions regulate the distribution of elements in the primary magmatic rocks and in the minerals of these rocks and also that these principles have made possible the prediction of unknown facts. Mr. Helbig rendered an outstanding lecture, complete in well prepared facts, which was truly a compliment to a great scientist of our day.

William Stadler, Sec.

Gem Stone Collectors of Utah

The Gem Stone Collectors of Utah held their first serious display on Dec. 19, 1947. An estimated $5.000 worth of stones were shown, the prize winning collection being that of Dr. B. D. Bennion.

Dr. Bennion is the new president for 1948, succeeding Mr. C. L. Pettit. The Society is now entering its third year.

K. O. Stewart, Sec.

Pomona Valley Mineral Club

The December meeting of the Pomona Valley Mineral Club was held in the Chemistry Building of Pomona College, Claremont, Calif. The speaker of the evening was Mr. George Burnham of Monrovia, California. His subject was "Collecting Minerals in Mexico." He started with his first trouble in getting his papers through all of his trip, and ended with his trouble in getting out of Mexico. He told some of the customs of the people, of beautiful old churches, and age-old towns. He gave graphic descriptions of the curiosity and friendliness of the Mexicans while he was gathering his specimens from various mines, some of which have been worked since the times of the Spaniards. Mr. Burnham exhibited beautiful specimens collected on his trip, including white garnets, apatite, calcite, wulfenite, and vanadinite crystals. After his interesting and informative lecture, all members were anxious to leave for Mexico and duplicate his experiences.

Door prizes for the evening were won by the Misses Legee and Saylor, and Mrs. Page.

The January meeting of the Pomona Valley Mineral Club was held in the Chemistry Building of Pomona College, Claremont, Calif.

The speaker of the evening was Mr. Stanton Hill, geology teacher at Pasadena Junior College, who gave an illustrated lecture on "The Outstanding Minerals in the Harvard Museum Collection". The Pomona Valley Club was the second organization in this vicinity to have the pleasure of seeing these slides.

Mr. Hill started by giving a brief history of the illustration of minerals. He told of the earliest attempts at colored mineral illustrations made in France between 1700 and 1800 which were painstakingly colored by hand. He stated that some of the German books are the best by the standard of illustration and showed some small books published in the early 1930's. These sold for about 25 cents each, and had very beautiful illustrations in full color. But, he explained, even as good as most of the books he discussed were, the coloring was not true and was inferior to the color film we now have.

He told of the slides he was to show, which are distributed by the Ward's Natural Science Establishment. Mr. Hill explained the many problems encountered inthe photographing of the minerals. It is difficult to make kodachromes, as the background, lighting focus, exposures and shutter speed are different with each specimen photographed.

These slides are unbelievably beautiful and are so true to life even the amateur mineralogist has no difficulty in recognizing the specimens. This collection, of course, represents the finest of each mineral and the crystalization in each is perfect. The entire set of slides would be a most welcome addition to a collector's library and are an education in themselves.

The Pomona Valley Mineral Club is indebted to Mr. Hill for his very informative lecture, and an extremely interesting evening.

C. W. Weist
Correspondent

Georgia Mineral Society

On Monday evening Jan. 5, 1948, the Georgia Mineral Society met in the Blue Flame Room of the Atlanta Gas Light Company, Atlanta, Ga.

A design for a seal to be used on documents and stationary was shown to the members and was well received, one minor change was suggested and the design was then passed to the executive committee. The design was the work of our untiring Secretary, Mr. Charles A. Wilkins.

Our guest speaker was Mr. Charles E. Hunter noted TVA Geologist and authority on the Geology of North Carolina. His topic was "A Mapped Tour of the Mineral and Gem Occurrences of Western North Carolina". He described the localities and gave detailed directions for reaching the best collecting areas. The members were kept busy marking locations and highways on road maps that were passed to each member before the talk began. Vacation and weekends will see a good percentage of the members cranking up and heading their cars toward North Carolina.

Before and after the meeting Mr. Joachim exhibited some very rare and unusual Cabochons and faceted stones.

S. C. Knox
Corresponding Secretary

Texas Mineral Society
(Dallas, Texas)

A contest and exhibit were held at the regular monthly meeting of the Texas Mineral Society in Dallas, January 13th, at the Baker Hotel. Ribbons were given for winners of five classes of minerals, as follows:

A. *Crystals:*
1st—Mrs. Hattie Churchill.
2nd—Mr. Carpenter.
3rd—Mr. B. Salas.

B. *General:*
1st—Mr. J. D. Churchill.
2nd—Mr. Wm. LaDew.
3rd—Mrs. Gilmore.

C. *Fluorescence:*
1st—Mr. J. D. Churchill.
2nd—Mr. B. Salas.

D. *Slab Agate:*
1st—Dr. V. Bryant.
2nd—Mr. R. C. McIver.
3rd—Mr. J. D. Churchill.

E. *Cabochons:*
1st—Mr. Wm. LaDew.
2nd—Mr. J. D. Churchill.

Judges were: Dr. Arthur Richards from S.M.U.; Dr. Jack Boon from N.T.A.C.; Roy Yeager and John B. Litsey.

Ralph D. Churchill Secretary

The Rocks & Minerals Club of Woodstock, Vt.

During the past few weeks our club has participated in several important events in addition to regular business meetings and social periods. Perhaps the foundation of these was the printing of a winter program as follows:

November—Annual educational tour, Annual public meeting and specimen display with first annual speaker.

December—Visit Woodstock Country School, Family night.

January—Second annual speaker; Visit Dr. Doubleday on crystallography.

February—Specimen sale R & M allied hobby show.

March—Third annual speaker; Visit High School.

April—Club birthday; Annual educational tour.

Summer program starts in May.

We were fortunate in securing a show window from The Elm Tree Press to present a large display of rocks and minerals, courtesy of Mr. Ronald Gallup.

Just before Thanksgiving our annual roundup occurred. Renting the Universalist Church parlors, we staged a display by trips of the specimens gathered during the summer from the field. This was enhanced by a fluorescent show and mineralogical literature. Mr. Harold Slade, Mr Victor Johnson, and Mr. Harold Chandler of the Springfield, Vt., Mineralogical Society visited us. Among the materials exhibited by these men was the spectacular cabochon and gem display of Mr. Slade. We are indebted to Mr. Johnson for arranging the visit and to Mr. Chandler for giving a revealing talk on "The Community and Educational Value of a Mineralogical Society." Graphically outlined were the branches of mineralogy: lapidary, crystallography, micro-mounts, fluorescent work, specimen collection,literature, photography, museum, prospecting, gemology, and instruction. Thus it was shown how broad are the possibilities for the individual regardless of his knowledge or depth of interest. Mr. Chandler indicated how the pursuit of mineralogy would fill the idle moments of both juniors and seniors enjoyably and informatively; would bring him into helpful nature, literary, and social contacts locally and nationally; would even give him a possible life work. For instance Mr. Maurice Crandall who is famed for his Indian collection, Mr. David Stewart of Harvard University and Peabody Museum, Mr. Francis McKenzie of Colorado University, and Mr. Ernest St. Mary of Eden Mills Mines and Brown University, all got their start in the Springfield, Vt., Mineralogical Society.

For the holidays our club was given an informative flyer on the club by Mr. Gallup, and the club members and interested persons received hand-made greetings.

We are pleased to write that another fine event occurred at the first meeting of the new year. Dr. Arthur Doubleday of Woodstock, a person noted for his work and writings on organic salts, crystallography, gave a fine talk on the six major crystal systems. Following this micro-mounts and slides were viewed on his petrological microscope. The evening was climaxed by having Mr. Ronald Gallup show color slides of many rocks and minerals both natural and fluoresced.

The Rocks & Minerals Club of Woodstock, Vt., is now sponsoring weekly lapidary classes under guidance of Mr. Ronald Gallup at the local Community Ct. These are closely linked with the metal arts classes under the instruction of Mr. Donald Cooley.

Ronald W. Gallup
Club Advisor

Newark Mineralogical Society

The 253rd meeting of the Newark Mineralogical Society was held in the Newark Museum, Newark, N. J. , on Sunday, Jan. 4, 1948.

The guest speaker for the first meeting of the new year was Mr. William C. Casperson, Curator of the Paterson Museum.

The Society always looks forward to Mr. Casperson's talks because they present new fields for thought. His topic this time concerned a relatively new type of mineralogy—the recovery of heavy gravity minerals from the shores of oceans and rivers. In a world which is rapidly exploiting its natural resources in the face of ever-increasing need, these new sources of supply are of tremendous value.

Mr. Casperson and his son are, at present, extracting these heavy minerals from the sands of an area near Jacksonville, Florida. The minerals contained in the Florida sands in largest quantity are: Zircon, Rutile, Garnet, Ilmenite, and Monazite. The latter mineral is one which is used in the creation of atomic energy, and as such, its extraction and sale is under government regulation at present. The other minerals found in the heavy gravity sands have many industrial uses which range from the prosaic, to the highly romantic construction of synthetic rubies, and diamonds of exceptional brilliance.

Most of the heavy gravity minerals and sands are representative of the minerals and gem stones found inland in a direction north or northwest of the shore mineral areas. To the uninitiated, the mineral bearing sands are black in color, but when broken into component parts, each mineral is found to show its particular color and structure.

Mr. Casperson's talk on this fascinating subject aroused a great deal of interest among the members of the Society and opened to many of these ardent "rockhounds," an entirely new mineralogical world.

Dorothy Webb
For Publicity Committee

Mineralogical Society of So. California

Mr. William B. Sanborn, Ranger Naturalist for the past two summers at Yellowstone National Park, was the speaker at the December meeting of the Mineralogical Society of Southern California. His topic was the Geology of Yellowstone National Park and covered particularly the back country of the region which is seldom visited by the ordinary vacationist in the area.

Beautifully illustrating his lecture with excellent Kodachrome slides, Mr. Sanborn was able to bring the park right to his audience. The four approaches to the park were shown and then the first stop off at Mammoth Hot Springs. Here fissures going deep into the rhyolite tap the hot magmas below. Surface waters forming an underground water table are heated thus causing the water to bubble up to the surface again carrying travertine with it.

Then on to the Norris Geyser Basin where are found many geysers each different—some playing for a few seconds, others for hours, and each depositing cinter-geyserite at the rate of 1/64 of an inch a year. Then the Monument Geyser Basin and Sentinel Creek region in the southwest portion of the park where are found seven huge mounds of sinter beautifully colored by the algae which are present in the hot waters.

Next a stop off at the Union Geyser (the sixth largest in the world) a geyser that plays simultaneously from three vents for a period of half an hour. There were innumerable wanderings to little known spots to visit beautiful pools, geysers large and small, and phenomena such as the little Fire Cracker geyser that sounds off regularly with sharp reports and the little geyser that inexplicably erupts a jet of not hot, but ice-cold water.

Finally there was a visit to the Canyon of the Yellowstone itself; a canyon cut, buried by glacial debris and recut with the infinite patience and relentless force that nature has exhibited throughout all geologic time.

Mr. Vance, Mr. Rodakohr, and Mr. Calvert added to the evenings program with a most interesting account of their recent trip down into Mexico. As proof of the success of their trip they had a most beautiful exhibit of the minerals they had collected.

Mr. H. Stanton Hill was the speaker at the January meeting of the Mineralogical Society of Southern California. He presented to the society for their first showing on the west coast the Minerals of the Harvard University Museum beautifully photographed in natural color.

These slides are the set that Ward's Natural Science Establishment has recently made available to the general public and represent over one hundred of the finest crystals, crystal groups, gems, and minerals from the world famous collection of the Harvard University Museum. The M.S.S.C. has just recently purchased this set in order to make them available to mineralogical societies on the west coast.

Beautifully photographed, with appropriate backgrounds, and excellent lighting these natural colored slides seem to be the next best thing to having the specimens actually before you. They present outstanding specimens from famous localities all over the world. Mr. Hill's comments on the specimens and the localities that they represent did much to add to the enjoyment of the slides.

Pauline Saylor
Covina, Calif.

Boston Mineral Club

The Boston Mineral Club meets the first Tuesday of each month at the Boston University College of Liberal Arts, 725 Commonwealth Ave., Boston, Mass. The president, Mr. Howard T. Evans, Jr., of M.I.T., gave an excellent illustrated talk on "Inclusions in Mica" at the Jan. 6th, 1948, meeting.

North Country Mineralogical Club

Our January meeting was held on Thursday evening, January 15th, at the Plattsburgh State Teachers College, Plattsburgh, N. Y. This was our annual meeting, the first anniversary of the formal organization of the Club. The following officers were reelected for the ensuing year: President, Mr. William R. Ellsbury, of Keeseville; Vice-president, Miss Jacqueline Hoff, Plattsburgh; Treasurer, Mr. Arthur Sandiford, of the Champlain College faculty; Secretary, Miss Gertrude Cone, Keeseville. Miss Helen Hale, Librarian of the Plattsburgh Public Library, was appointed Custodian of Property.

A scrap book has been prepared showing the Club's activities throughout the past year. This includes newspaper clippings about all meetings and field trips, snap-shots of the Club and smaller groups of members taken on the field trips, and wherever possible, small specimens of the minerals found, marked with name, location, Dana classification number, and the chemical formula.

The program for the meeting was furnished by Dr. Everett A. Manwell, of the Plattsburgh State Teachers College Science Department. Dr. Manwell's subject was oil, one of the earth's most valuable minerals. His talk, accompanied by pictures, traced the history of the use of oil from ancient times to the present. The speaker also told something of the methods used in prospecting for oil, the types of geological formations in which it occurs, the scientific theories explaining the occurrence of oil in the earth's evolution, and the advances made during the last century in machinery used in drilling and in controlling the flow from wells. Dr. Manwell's discussion made us all feel much better informed on the subject.

Gertrude E. Cone, Secretary

Pacific Mineral Society, Inc.
of Los Angeles, California
Pegmatites of The Pala District

Dr. Richard Jahns, Associate Professor of Geology at the California Institute of Technology, was the speaker at the dinner meeting of the Pacific Mineral Society, Inc., on January 9th 1948. Having spent the past two years doing extensive work on the pegmatites of California, especially in the Pala district, he was able to give us interesting informaton.

The discovery of the gem localities in San Diego County, Calif., occurred about 75 years ago when a rancher, pushing through the brush while deer hunting in what is now known as the Pala District, found a pink pencil-like crystal. Being unfamiliar with minerals, he did not know what the crystal was, but as it looked pretty to him, he took it home and kept it on the mantel. It was not until several years later that a friend visiting him noticed the crystal and recognized it as tourmaline, for he had dug and collected the same type of crystal near his home in Maine. Realizing then the possible value of his discovery, the rancher returned to the location where the crystal was found and was able to locate a layer of rock about four feet thick which contained similar crystals. He lost no time in staking out a claim. About this same time the Government had allotted a number of parcels of apparently worthless land to the Indians and this discovery, and those following, were almost all on Indian land. However, the regulations in force at that time permitted private claims to be staked on Indian land, with the result that all of the gem claims were privately owned.

Development of the original strike and further exploration soon brought to light a number of these pegmatite ledges which contained gem material. Quite a number of years later, Mesa Grande was opened up and this turned out to be an enormous producer of gem tourmaline; in fact, its production was so great, that it controlled the market and finally broke it. Dr. Jahns stated that one single shipment of gem material amounted to thirteen tons.

The Chinese became very fascinated with tourmaline, preferring it even to Jade, and it was their choice stone for cutting and carving, with the result that most of the tourmaline mined in San Diego County went to China. However, with the overthrow of the Imperial Dynasty, the demand stopped almost entirely. The loss of this market caused a tremendous drop in the price, forcing most of the mines to cease operation on a large scale very soon thereafter.

Dr Jahns stated that besides various colored tourmalines, a number of other gem minerals were found, such as Beryl in different colors, and topaz. However, the most phenomenal discovery of all was clear, transparent spodumene. Pieces of this clear mineral were noticed for several years, but no one seemed able to identify it. Finally a sample was sent to Dr. Geo. F. Kunz, mineralogist for Tiffany's of New York and he identified it as Spodumene. Later a pink variety was named Kunzite in honor of Dr. Kunz. Spodumene is quite common in many pegmatites and sometimes grows to enormous crystals, one of them in South Dakota being 56 feet in length. Dr. Jahns mentioned also a small mine in operation which was entirely within a single crystal. However, Pala was the first place where spodumene was ever found as gem material and still is one of the few places in the world where it is found.

Dr. Jahns told us that from his studies of the Pala pegmatites, it seemed evident that the gem spodumene is the remnant of larger crystals which apparently altered not so long after their formation, as it is possible to see traces of the cleavage planes, striations, etc. of the mass which encloses the gem material.

Our January field trip will be to Pala on Jan. 25th, and after this excellent talk, it should be interesting indeed. We all hope a few tourmalines have been overlooked by other rockhounds, so that we can add to our collection.

Mrs. O. C. Smith
Pub. Chairman

New York Mineralogical Club

American Museum of Natural History, New York. Wednesday, December 17, 1947.

The president, Dr. F. H. Pough, announced that future meetings of the Club will be held at room 403, Schermerhorn, Columbia University.

Dr. Daniel T. O'Connell announced that an elementary lapidary course would be offered at City College in February, 1948. A lapidary and gem course will be offered at Brooklyn College in April, 1948.

Clare Braitman, Edward Kennard, Walter Allen, Theodore Fredericks, and Richard Yasner were elected to membership.

The speaker of the evening was Dr. J. Daniel Willems who cuts gems as a hobby. He gave a brief introduction on the history of gems as ornaments, and the principal gem producing localities. A Kodachrome motion picture "The Story of Gems" was then shown. The picture was taken by Mr. E. J. Mauthner and showed the progressive steps in the cutting of a cabochon from the selection of the rough material to the final polishing. All the steps were demonstrated by Dr. Willems. The second part of the film showed the procedure used in cutting facets. Dr. Willems started with a crystal of golden beryl and showed the sawing of the crystal, the rough shaping of the stone, the fine grinding and polishing of the facets. The result was a magnificent sparkling gem. The film was excellent and was thoroughly enjoyed by all present.

Purfield Kent, Secretary